

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 736 838  
Injection pump  
Pump designation : PES6P120A120RS7275  
EP type number : 0 412 726 886  
Governor  
Governor design. : RQV400...1250PA964  
-16K  
Governor no. : 0 421 815 334

Customer spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 119.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 105...125

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 15.3...15.5

100 s: (15.0...15.8)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 400

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.4...2.0

100 s: (1.2...2.2)

Spread cm3 : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 1.40...1.60

2nd speed rpm : 500  
travel mm : 2.30...2.70

3rd speed rpm : 800  
travel mm : 4.80...5.20

4th speed rpm : 1250  
travel mm : 6.90...7.10

5th speed rpm : 1500  
travel mm : 8.30...8.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1200  
Del.quantity : 152.5...154.5  
1000 : (149.5...157.5)  
Spread cm3 : 8.00  
1000 : (12.00)

## RATED SPEED

1st version

Control lever

position degrees: 110...122

Testing:

1st rack travel in: 12.40

Speed rpm : 1310...1340

2nd rack travel in: 4.00

Speed rpm : 1560...1570

4th rack travel in: 1675

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 65...77

Setting point w/out bumper spring

Speed rpm : 400

Rack travel in mm : 6.2

Testing:

Speed rpm : 300

Minimum rack travel: 7.70

Speed rpm : 400

Rack travel in mm : 6.00...6.40

CONSTANT REGULATION

Speed rpm : 325...519

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 13.40...13.50

2nd speed rpm : 900

Rack travel in m: 12.00...12.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 1250

Pressure hPa : 1200

Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 1250

1st pressure hPa : -

Rack travel in m: 10.30...10.70

2nd pressure hPa : 265

Rack travel in m: 11.10...11.20

3rd pressure hPa : 440

Rack travel in m: 12.70...13.10

START CUT-OUT

A02

Speed 1/min : 250 (260)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 900

Del.quantity cm3/ : 130.5...136.5

1000 s: (127.5...139.5)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 1250

Del.quantity cm3/ : 108.5...112.5

1000 s: (106.5...114.5)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40

Speed rpm : 1310...1340

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 12.00...13.00

## LOW IDLE

Speed rpm : 450

Rack travel in mm : 6.00...6.40

Del.quantity cm3/ : 14.0...20.0

1000 s: (12.0...22.0)

Spread cm3 : 4.00

1000 s: (8.00)

Remarks:

: FB-BLOCK. 6.25° NACH

: /AFTER FB ZYL. 1

: C.D.C. # 392 1918

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 736 838  
Injection pump  
Pump designation : PES6P120A120RS7275  
EP type number : 0 412 726 886  
Governor  
Governor design. : RQV400...1250PA964  
-19K  
Governor no. : 0 421 815 342

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 130.5  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 105...125

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 15.9...16.1

100 s: (15.6...16.4)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 400

Rack travel in mm : 5.9...6.3

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.2...2.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.30...1.50

2nd speed rpm : 500

travel mm : 2.30...2.70

3rd speed rpm : 800

travel mm : 4.80...5.20

4th speed rpm : 1250

travel mm : 6.90...7.10

5th speed rpm : 1500

travel mm : 8.30...8.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del.quantity : 159.5...161.5

1000 : (156.5...164.5)

Spread cm<sup>3</sup> : 8.00

1000 : (12.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 111...123

### Testing:

1st rack travel in: 12.40  
Speed rpm : 1300...1330  
2nd rack travel in: 4.00  
Speed rpm : 1560...1570  
4th rack travel in: 1675  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 65...77  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.10

### Testing:

Speed rpm : 300  
Minimum rack travel: 7.40  
Speed rpm : 400  
Rack travel in mm : 5.90...6.30

## CONSTANT REGULATION

Speed rpm : 325...519

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 900  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 500  
Rack travel in m: 11.30...11.70

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

## Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 260  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 430  
Rack travel in m: 12.80...13.20

## START CUT-OUT

Speed 1/min : 250 (260)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 900  
Del.quantity cm3/ : 135.0...141.0  
1000 s: (132.0...144.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm3/ : 110.0...114.0  
1000 s: (108.0...116.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1300...1330

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 13.00...14.00

## LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.30  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (12.0...22.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

## Remarks:

: FB-BLOCK. 6.25° NACH  
: /AFTER FB ZYL. 1  
: C.D.C. # 392 1920



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : 07.93  
Test oil : ISO-4113  
  
Combination no. : 0 402 736 844  
  
Injection pump  
Pump designation : PES6P120A120RS7287  
EP type number : 0 412 726 896  
Governor  
Governor design. : RQV400...1250PA964  
-21K  
Governor no. : 0 421 815 354

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 171.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 15.00...15.10

Del. quantity cm<sup>3</sup>/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 400.0

Rack travel in mm : 6.1...6.5

Del. quantity cm<sup>3</sup>/ : 1.5...2.1

100 s: (1.3...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.40...1.60

2nd speed rpm : 550

travel mm : 3.10...3.50

3rd speed rpm : 800

travel mm : 4.30...4.70

4th speed rpm : 1250

travel mm : 7.00...7.20

5th speed rpm : 1500

travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1200

Del. quantity : 199.0...201.0

1000 : (196.0...204.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114.0...122.0

#### Testing:

1st rack travel in: 13.50  
Speed rpm : 1310...1320  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68.0...76.0

#### Testing:

Speed rpm : 300  
Minimum rack travel: 7.80  
Speed rpm : 400  
Rack travel in mm : 6.10...6.50

#### CONSTANT REGULATION

Speed rpm : 325...521

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 900  
Rack travel in m: 14.30...14.50  
3rd speed rpm : 600  
Rack travel in m: 13.20...13.60  
4th speed rpm : 1250  
Rack travel in m: 14.50...14.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

#### Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 10.10...10.50  
2nd pressure hPa : 355  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 645

A06

Rack travel in m: 13.30...13.70

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 900  
Del.quantity cm3/ : 183.0...189.0  
1000 s: (180.0...192.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1150  
Del.quantity cm3/ : 94.5...98.5  
1000 s: (92.5...100.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1310...1320

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.10...6.50  
Del.quantity cm3/ : 15.0...21.0  
1000 s: (13.0...23.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3921925

Mark position of port-opening mark  
6.25° before port opening cylinder 1  
on clutch

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 736 846  
Injection pump  
Pump designation : PES6P120A120RS7287  
EP type number : 0 412 726 896  
Governor  
Governor design. : RQV400...1250PA1081K  
Governor no. : 0 421 815 360

Customer-spec. information  
Customer : C.D.C

Engine : 6BTA-A

1st version kW : 156.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250  
Rack travel in mm : 13.80...13.90  
Del.quantity cm3/ : 17.2...17.4  
100 s: (16.9...17.7)

Spread cm3 : 0.8  
100 s: (1.2)

2nd speed rpm : 400.0  
Rack travel in mm : 6.0...6.4  
Del.quantity cm3/ : 1.8...2.4  
100 s: (1.6...2.6)  
Spread cm3 : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 1.40...1.60  
2nd speed rpm : 550  
travel mm : 3.10...3.50  
3rd speed rpm : 800  
travel mm : 4.30...4.70  
4th speed rpm : 1250  
travel mm : 7.00...7.20  
5th speed rpm : 1500  
travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1200  
Del.quantity : 172.5...174.5  
1000 : (169.5...177.5)  
Spread cm3 : 8.00  
1000 : (12.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...124

Testing:  
1st rack travel in: 12.80  
Speed rpm : 1315...1345  
2nd rack travel in: 4.00  
Speed rpm : 1480...1490  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...78  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 300  
Minimum rack travel: 8.90  
Speed rpm : 400  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 345...495

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 800  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 500  
Rack travel in m: 11.15...11.55

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 305  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 585  
Rack travel in m: 12.60...13.00

START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 138.5...144.5  
1000 s: (135.5...147.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 1250  
Del.quantity cm3/ : 89.0...93.0  
1000 s: (87.0...95.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 1315...1345

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.00...6.40  
Del.quantity cm3/ : 18.0...24.0  
1000 s: (16.0...26.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

Remarks:  
: C.D.C. # 392 4903

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 736 847  
Injection pump  
Pump designation : PES6P120A12ORS7287  
EP type number : 0 412 726 896  
Governor  
Governor design. : RGV400...1250PA964  
-22K  
Governor no. : 0 421 815 366

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 156.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.30...14.40

Del.quantity cm3/ : 17.7...17.9

100 s: (17.4...18.2)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 400

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.6...2.2

100 s: (1.4...2.4)

Spread cm3 : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.40...1.60

2nd speed rpm : 550

travel mm : 3.10...3.50

3rd speed rpm : 800

travel mm : 4.30...4.70

4th speed rpm : 1250

travel mm : 7.00...7.20

5th speed rpm : 1500

travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1200

Del.quantity : 177.0...179.0

1000 : (174.0...182.0)

Spread cm3 : 8.00

1000 : (12.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...124

Testing:

1st rack travel in: 13.10  
Speed rpm : 1300...1330  
2nd rack travel in: 4.00  
Speed rpm : 1475...1485  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 66...78  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.20

Testing:

Speed rpm : 300  
Minimum rack travel: 8.80  
Speed rpm : 400  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION

Speed rpm : 345...495

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.10...14.30  
2nd speed rpm : 1150  
Rack travel in m: 14.30...14.40  
3rd speed rpm : 800  
Rack travel in m: 13.10...13.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 14.30...14.40

Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.40...10.80  
2nd pressure hPa : 425  
Rack travel in m: 11.40...11.50  
3rd pressure hPa : 685  
Rack travel in m: 13.20...13.60

START CUT-OUT

A10

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 159.0...165.0  
1000 s: (156.0...168.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1150  
Del.quantity cm3/ : 99.0...103.0  
1000 s: (97.0...105.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1300...1330

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.00...13.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.00...6.40  
Del.quantity cm3/ : 16.5...22.5  
1000 s: (14.5...24.5)  
Spread cm3 : 4.00  
1000 s: (8.00)

Remarks:

: FB-BLOCK. 6.25° NACH  
: /AFTER FB ZYL. 1  
: C.D.C. # 392 1923

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 736 848

Injection pump  
Pump designation : PES6P120A120RS7314  
EP type number : 0 412 726 901  
Governor  
Governor design. : RQV400...1250PA964-2  
3K  
Governor no. : 0 421 815 374

Customer-spec. information  
Customer : CDC

Engine : 6BTA-A

1st version kW : 142.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50(0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 14.20...14.30  
Del.quantity cm3/ : 16.5...16.7  
100 s: (16.2...17.0)  
Spread cm3 : 0.8  
100 s: (1.2)

2nd speed rpm : 400  
Rack travel in mm : 6.9...7.3  
Del.quantity cm3/ : 1.5...2.1  
100 s: (1.3...2.3)  
Spread cm3 : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 1.80...2.00  
2nd speed rpm : 550  
travel mm : 3.30...3.70  
3rd speed rpm : 800  
travel mm : 4.30...4.70  
4th speed rpm : 1250  
travel mm : 7.10...7.30  
5th speed rpm : 1500  
travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 1200  
Del.quantity : 165.5...167.5  
1000 : (162.5...170.5)  
Spread cm3 : 8.00  
1000 : (12.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...124

### Testing:

1st rack travel in: 12.80  
Speed rpm : 1295...1325  
2nd rack travel in: 4.00  
Speed rpm : 1465...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 66...78  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 7.10

### Testing:

Speed rpm : 300  
Minimum rack travel: 9.80  
Speed rpm : 400  
Rack travel in mm : 6.90...7.30

## CONSTANT REGULATION

Speed rpm : 345...495

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.20...14.30  
2nd speed rpm : 800  
Rack travel in m: 13.00...13.40  
3rd speed rpm : 1250  
Rack travel in m: 13.80...14.00

Aneroid/Altitude  
Compensator Test

## 1st version

### Setting

Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 14.20...14.30

### Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 11.10...11.50  
2nd pressure hPa : 375  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 500  
Rack travel in m: 13.10...13.50

## START CUT-OUT

Speed 1/min : 290 (300)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 144.0...150.0  
1000 s: (141.0...153.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1150  
Del.quantity cm3/ : 106.5...110.5  
1000 s: (104.5...112.5)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1295...1325

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 13.50...14.50

## LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.90...7.30  
Del.quantity cm3/ : 15.0...21.0  
1000 s: (13.0...23.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

### Remarks:

: C.D.C. # 392 1922

Start-of-delivery blocking 5,75° after  
start of delivery of cylinder no. 1.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 736 848

Injection pump  
Pump designation : PES6P120A120RS7314  
EP type number : 0 412 726 901  
Governor  
Governor design. : RQV400...1250PA964-2.  
3K  
Governor no. : 0 421 815 374

Customer-spec. information  
Customer : CDC

Engine : 6BTA-A

1st version kW : 142.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
(3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50(0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 400.0  
Rack travel in mm : 6.9...7.3  
Del.quantity cm3/ : 1.5...2.1  
100 s: (1.3...2.3)  
Spread cm3 : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 1.40...1.60  
2nd speed rpm : 550  
travel mm : 3.10...3.50  
3rd speed rpm : 800  
travel mm : 4.30...4.70  
4th speed rpm : 1250  
travel mm : 7.00...7.20  
5th speed rpm : 1500  
travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 1200  
Del.quantity : 165.5...167.5  
1000 : (162.5...170.5)  
Spread cm3 : 8.00  
1000 : (12.00)

## RATED SPEED

1st version

Control lever

position degrees: 112...124

Testing:

1st rack travel in: 12.70

Speed rpm : 1295...1325

2nd rack travel in: 4.00

Speed rpm : 1465...1475

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 66...78

Setting point w/out bumper spring

Speed rpm : 400

Rack travel in mm : 7.10

Testing:

Speed rpm : 300

Minimum rack travel: 9.80

Speed rpm : 400

Rack travel in mm : 6.90...7.30

CONSTANT REGULATION

Speed rpm : 345...495

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 14.10...14.20

2nd speed rpm : 800

Rack travel in m: 13.00...13.20

3rd speed rpm : 1250

Rack travel in m: 13.80...14.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 1150

Pressure hPa : 1200

Rack travel mm : 14.10...14.20

Measurement

Speed 1/min : 1150

Rack travel in m: 11.10...11.50

2nd pressure hPa : 375

Rack travel in m: 12.10...12.20

3rd pressure hPa : 500

Rack travel in m: 13.10...13.50

START CUT-OUT

Speed 1/min : 290 (300)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 144.0...150.0

1000 s: (141.0...153.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Speed rpm : 1150

Del.quantity cm<sup>3</sup>/ : 106.5...110.5

1000 s: (104.5...112.5)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70

Speed rpm : 1295...1325

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 13.50...14.50

## LOW IDLE

Speed rpm : 400

Rack travel in mm : 6.90...7.30

Del.quantity cm<sup>3</sup>/ : 15.0...21.0

1000 s: (13.0...23.0)

Spread cm<sup>3</sup> : 4.00

1000 s: (8.00)

Remarks:

: C.D.C. # 392 1922

Start-of-delivery blocking 5,75° after  
start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 02.94  
Replaces : 04.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 918  
  
Injection pump  
Pump designation : PES6P120A720LS7238  
-10  
EP type number : 0 412 726 873  
Governor  
Governor design. : RQ300/1100PA1013  
Governor no. : 0 421 801 599

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 hLA

1st version kW : 220.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/ : 21.3...21.5

100 s: (21.0...21.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300

Rack travel in mm : 6.0...6.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 600

Del.quantity : 213.0...215.0

1000 : (210.0...218.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 94.0...102.0

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.60  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 69.0...77.0  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.30

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 600  
Rack travel mm : 14.00...14.20

Measurement  
Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 800  
Rack travel in m: 14.30...14.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1100  
Del.quantity cm3/ : 229.0...232.0  
1000 s: (226.0...235.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 700  
Del.quantity cm3/ : 233.0...237.0  
1000 s: (230.0...240.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 140.0...142.0  
1000 s: (137.0...145.0)  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 1145...1161

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 02.94  
Replaces : 08.92  
Test oil : ISO-4113

Combination no. : 0 402 746 922

Injection pump  
Pump designation : PES6P120A720LS7238-1  
EP type number : 0 412 726 873  
Governor  
Governor design. : RQ300/1100PA1013-3  
Governor no. : 0 421 801 609

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 hLA

1st version kW : 220.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.70)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.70...13.90

Del.quantity cm3/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300

Rack travel in mm : 5.9...6.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 600

Aneroid pressure h: 600

Del.quantity : 205.0...207.0

1000 : (202.0...210.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 94.0...102.0

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.50  
Speed rpm : 1145...1161  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 69.0...77.0  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.20

Testing:

Speed rpm : 200  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 600  
Rack travel mm : 13.70...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : 150  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 350  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 800  
Rack travel in m: 13.90...14.10  
4th pressure hPa : 950  
Rack travel in m: 14.30...14.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 1100  
Del.quantity cm3/ : 221.0...224.0  
1000 s: (218.0...227.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 140.0...142.0  
1000 s: (137.0...145.0)

Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1145...1161

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 02.94  
Replaces : 10.92  
Test oil : ISO-4113

Combination no. : 0 402 746 923X

Injection pump  
Pump designation : PES6P120A720LS7237-1  
EP type number : 0 412 726 872  
Governor  
Governor design. : RQ300/1100PA1013-2  
Governor no. : 0 421 801 611

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 hA

1st version kW : 184.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 120...140

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.65...13.75

Del.quantity cm<sup>3</sup>/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 95.0...103.0

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70  
Speed rpm : 1145...1161  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 72.0...80.0  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.50

Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 12.00...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : 600  
Rack travel in m: 12.65...12.75  
2nd pressure hPa : 800  
Rack travel in m: 12.85...13.05

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 201.0...205.0  
1000 s: (198.0...208.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1145...1161

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 02.94  
Replaces : 12.93  
Test oil : ISO-4113

Combination no. : 0 402 746 958

Injection pump  
Pump designation : PES6P120A720LS7209-2  
EP type number : 0 412 726 898  
Governor  
Governor design. : RQV300...900PA1103  
Governor no. : 0 421 814 076

Customer-spec. information  
Customer : MAN

Engine : D2866LE40

1st version kW : 265.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
                  : (4.75...4.95)  
Rack travel in mm : 12.50...13.50  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 11.20...11.30

Del. quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.1...5.5

Del. quantity cm<sup>3</sup>/ : 4.4...5.0

100 s: (4.1...5.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.12...1.32

2nd speed rpm : 360

travel mm : 1.79...2.19

3rd speed rpm : 410

travel mm : 2.36...2.56

4th speed rpm : 656

travel mm : 4.54...4.94

5th speed rpm : 966

travel mm : 8.35...8.55

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1030

Rack travel in mm : 9.50...12.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116.0...124.0

Testing:  
1st rack travel in: 10.20  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 79.0...87.0

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 275...405

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 208.0...228.0  
1000 s: (204.0...232.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.10...5.50  
Del.quantity cm3/ : 43.0...49.0  
1000 s: (40.0...52.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 3-7304/1  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet :  
Edition : 21.06.91  
Replaces :  
Test oil : ISO-4113  
  
Combination no. : A KV1 877 8  
  
Injection pump  
Pump designation : PE6P120A320LS7834  
EP type number : 0 412 626 841  
Governor  
Governor design. : RG300/95CPA971  
Governor no. : 0 421 801 543

Customer-spec. information  
Customer : MB-NFZ

Engine : OM401 LA

1st version kW : 230.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
-360

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del.quantity cm<sup>3</sup>/ : 22.7...22.9

100 s: (22.4...23.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 2.00...2.30

2nd speed rpm : 500  
travel mm : 5.90...6.10

3rd speed rpm : 950  
travel mm : 6.30...6.50

4th speed rpm : 1009  
travel mm : 6.60...6.80

5th speed rpm : 1160  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 108

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1100  
Del.quantity : 227.0...229.0  
1000 : (224.0...232.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 96...104

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.90  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL  
Dimension a mm : 0.35  
2nd speed rpm : 950  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600

Measurement  
Speed 1/min : 600

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1800  
Speed rpm : 950  
Del.quantity cm3/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 990...1005

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 236 005  
Injection pump  
Pump designation : PES6MW100/720/3RS151  
8-1  
EP type number : 0 413 206 018  
Governor  
Governor design. : RQV325...1300MW133-1  
K  
Governor no. : 0 420 083 984

Customer-spec. information  
Customer : PERKINS

Engine : 180TI

1st version kW : 134.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.95...5.05  
: (4.90...5.10)  
Rack travel in mm : 13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300  
Rack travel in mm : 14.30...14.40  
Del.quantity cm3/ : 13.8...14.0  
100 s: (13.5...14.3)  
Spread cm3 : 0.4  
100 s: (0.7)

2nd speed rpm : 325.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 2.1...2.5  
100 s: (1.9...2.7)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.45...1.95  
2nd speed rpm : 361  
travel mm : 2.09...2.59  
3rd speed rpm : 500  
travel mm : 3.67...4.17  
4th speed rpm : 881  
travel mm : 6.21...6.71  
5th speed rpm : 1355  
travel mm : 9.98...10.48

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1380  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 900  
Del.quantity : 138.0...140.0  
1000 : (135.0...143.0)

Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 13.30  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 325  
Rack travel in mm : 5.40...5.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : 900  
Rack travel mm : 14.30...14.40

#### Measurement

Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 9.25...6.35  
2nd pressure hPa : 250  
Rack travel in m: 10.25...10.35  
3rd pressure hPa : 400  
Rack travel in m: 12.85...13.15

#### START CUT-OUT

Speed 1/min : 240 (270)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1300

Del.quantity cm3/ : 138.0...143.0  
1000 s: (135.0...143.0)  
Spread cm3 : 4.00  
1000 s: (7.50)

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 135.0...139.0  
1000 s: (132.0...142.0)

Spread cm3 : 6.00  
1000 s: (9.00)

Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm3/ : 110.0...114.0  
1000 s: (107.0...117.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 71.0...73.0  
1000 s: (69.0...75.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...92.0  
1000 s: (75.0...95.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 09.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 244 031  
  
Injection pump  
Pump designation : PES4MW100/720RS1513-1  
EP type number : 0 413 204 014  
Governor  
Governor design. : RQV300...1300MW125-3  
Governor no. : 0 420 083 260

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kW : 104.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 21.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 12.1...12.3

100 s: (11.9...12.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.4

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (0.9...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.15...1.65

2nd speed rpm : 413

travel mm : 2.25...2.75

3rd speed rpm : 880

travel mm : 4.75...5.25

4th speed rpm : 1354

travel mm : 8.43...8.93

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1200

Del.quantity : 121.0...123.0

1000 : (119.0...125.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.00  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.80...12.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 6.80...7.00  
2nd pressure hPa : 300  
Rack travel in m: 8.10...8.30  
3rd pressure hPa : 700  
Rack travel in m: 11.25...11.35

#### START CUT-OUT

Speed 1/min : 180 (200)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 118.0...121.0  
1000 s: (115.5...123.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 35.0....37.0  
1000 s: (33.0...39.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 244 032  
Injection pump  
Pump designation : PES4MW100/720RS1519-1  
EP type number : 0 413 204 016  
Governor  
Governor design. : RQV300...1300MW132-1  
Governor no. : 0 420 083 292

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kW : 103.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)

Rack travel in mm : 21.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300  
Rack travel in mm : 13.85...13.95  
Del. quantity cm3/ : 12.5...12.7  
100 s: (12.2...13.0)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 3.7...3.9  
Del. quantity cm3/ : 1.0...1.4  
100 s: (0.75...1.65)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.66...1.16  
2nd speed rpm : 629  
travel mm : 2.9...3.4  
3rd speed rpm : 820  
travel mm : 3.86...4.34  
4th speed rpm : 1150  
travel mm : 5.7...6.2  
5th speed rpm : 1354  
travel mm : 7.52...8.02

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1510  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 1400  
Del. quantity : 125.0...127.0  
1000 : (122.0...130.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 67...75

Testing:  
Speed rpm : 200  
Minimum rack travel: 4.50  
Speed rpm : 300  
Rack travel in mm : 3.7...3.9

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1400  
Rack travel mm : 13.85...13.95

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 550  
Rack travel in m: 11.50...11.70  
3rd pressure hPa : 800  
Rack travel in m: 13.0...13.2

## START CUT-OUT

Speed 1/min : 200 (220)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1300  
Del.quantity cm3/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm3 : 5.00  
1000 s: (7.50)  
Aneroid pressure h: 1400

Speed rpm : 750  
Del.quantity cm3/ : 122.0...126.0  
1000 s: (119.0...129.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1400  
Speed rpm : 600  
Del.quantity cm3/ : 126.0...130.0  
1000 s: (123.0...133.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 66.0...68.0  
1000 s: (64.0...70.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...145.0  
1000 s: (132.0...148.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.7...3.9  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 244 032T3

Injection pump  
Pump designation : PES4MW100/720RS1519  
EP type number : 0 413 204 013  
Governor  
Governor design. : RQV300...1300MW132-1.  
Governor no. : 0 420 083 292

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kW : 103.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 14.0...14.2

100 s: (13.7...14.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.2...3.4

Del.quantity cm3/ : 1.0...1.4

100 s: (0.75...1.65)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.77...1.27

2nd speed rpm : 530

travel mm : 2.36...2.86

3rd speed rpm : 630

travel mm : 3.29...3.79

4th speed rpm : 939

travel mm : 5.52...6.02

5th speed rpm : 1355

travel mm : 9.95...10.45

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1400

Del.quantity : 140.0...142.0

1000 : (137.0...145.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version:  
Control lever  
position degrees: 110...118

### Testing:

1st rack travel in: 12.50  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 64...72

### Testing:

Speed rpm : 200  
Minimum rack travel: 4.00  
Speed rpm : 300  
Rack travel in mm : 3.2...3.4

Aneroid/Altitude  
Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1400  
Rack travel mm : 13.40...13.50

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.8...9.9  
2nd pressure hPa : 600  
Rack travel in m: 10.7...10.9  
3rd pressure hPa : 900  
Rack travel in m: 12.4...12.6

## START CUT-OUT

Speed 1/min : 180 (200)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1400  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 140.0...142.0  
1000 s: (137.0...145.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.50)  
Aneroid pressure h: 1400  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 133.0...137.0  
1000 s: (130.0...140.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1400  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 133.0...137.0  
1000 s: (130.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 57.0...59.0  
1000 s: (55.0...61.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...150.0  
1000 s: (137.0...153.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.2...3.4  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 244 034  
Injection pump  
Pump designation : PES4MW100/720RS1519  
EP type number : 0 413 204 013  
Governor  
Governor design. : RQV300...1300MW132-3.  
Governor no. : 0 420 083 296

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kW : 77.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)

Rack travel in mm : 21.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.5...11.6

Del.quantity cm3/ : 9.4...9.6

100 s: (9.2...9.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.1

Del.quantity cm3/ : 1.0...1.4

100 s: (0.75...1.65)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.66...1.16

2nd speed rpm : 629

travel mm : 2.9...3.4

3rd speed rpm : 800

travel mm : 3.75...4.25

4th speed rpm : 1140

travel mm : 5.63...6.13

5th speed rpm : 1345

travel mm : 7.39...7.89

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1400

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 94.0...96.0

1000 : (92.0...98.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 106...114

### Testing:

1st rack travel in: 1059  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 65...73

### Testing:

Speed rpm : 200  
Minimum rack travel: 4.50  
Speed rpm : 300  
Rack travel in mm : 3.9...4.1

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.5...11.6

### Measurement:

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.6...10.8  
2nd pressure hPa : 500  
Rack travel in m: 11.0...11.2

## START CUT-OUT

Speed 1/min : 200 (220)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 94.0...96.0  
1000 s: (92.0...98.0)  
Spread cm3 : 3.50  
1000 s: (6.00)  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 85.5...88.5  
1000 s: (83.0...91.0)

Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 65.0...67.0  
1000 s: (63.0...69.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...135.0  
1000 s: (122.0...138.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.9...4.1  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 244 032  
Injection pump  
Pump designation : PES4MW100/72ORS1519-1  
EP type number : 0 413 204 016  
Governor  
Governor design. : RQV300...1300MW132-1  
Governor no. : 0 420 083 292

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kW : 103.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)

Rack travel in mm : 21.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.85...13.95

Del.quantity cm<sup>3</sup>/ : 12.5...12.7

100 s: (12.2...13.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.7...3.9

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.75...1.65)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.66...1.16

2nd speed rpm : 629

travel mm : 2.9...3.4

3rd speed rpm : 820

travel mm : 3.84...4.34

4th speed rpm : 1150

travel mm : 5.7...6.2

5th speed rpm : 1354

travel mm : 7.52...8.02

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1400

Del.quantity : 125.0...127.0

1000 : (122.0...130.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 112...120

Testing:

1st rack travel in: 12.9

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1435...1465

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 67...75

Testing:

Speed rpm : 200

Minimum rack travel: 4.50

Speed rpm : 300

Rack travel in mm : 3.7...3.9

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 1400

Rack travel mm : 13.85...13.95

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.7...10.9

2nd pressure hPa : 550

Rack travel in m: 11.5...11.7

3rd pressure hPa : 800

Rack travel in m: 13.0...13.2

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400

Speed rpm : 1300

Del.quantity cm3/ : 125.0...127.0

1000 s: (122.0...130.0)

Spread cm3 : 4.00

1000 s: (7.50)

Aneroid pressure h: 1400

Speed rpm : 750

Del.quantity cm3/ : 122.0...126.0

1000 s: (119.0...129.0)

Spread cm3 : 6.00

1000 s: (9.00)

Aneroid pressure h: 1400

Speed rpm : 600

Del.quantity cm3/ : 126.0...130.0

1000 s: (123.0...133.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 66.0...68.0

1000 s: (64.0...70.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 135.0...145.0

1000 s: (137.0...148.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 3.7...3.9

Del.quantity cm3/ : 10.0...14.0

1000 s: (7.5...16.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 244 034  
Injection pump  
Pump designation : PES4MW100/720RS1519  
EP type number : 0 413 204 013  
Governor  
Governor design. : RQV300...1300MW132-3  
Governor no. : 0 420 083 296

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kw : 77.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.5...11.6

Del.quantity cm3/ : 9.4...9.6

100 s: (9.2...9.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.1

Del.quantity cm3/ : 1.0...1.4

100 s: (0.75...1.65)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.66...1.16

2nd speed rpm : 629

travel mm : 2.9...3.4

3rd speed rpm : 800

travel mm : 3.75...4.25

4th speed rpm : 1140

travel mm : 5.63...6.13

5th speed rpm : 1345

travel mm : 7.39...7.89

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1400

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 94.0...96.0

1000 : (92.0...98.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 106...114

### Testing:

1st rack travel in: 10.5  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 65...73

### Testing:

Speed rpm : 200  
Minimum rack travel: 4.50  
Speed rpm : 300  
Rack travel in mm : 3.9...4.1

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.5...11.6

## Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.6...10.8  
2nd pressure hPa : 500  
Rack travel in m: 11.0...11.2

## START CUT-OUT

Speed 1/min : 200 (220)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 94.0...96.0  
1000 s: (92.0...98.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (6.00)  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 85.5...88.5  
1000 s: (83.0...91.0)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 65.0...67.0  
1000 s: (63.0...69.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...135.0  
1000 s: (122.0...138.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.9...4.1  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 244 035  
  
Injection pump  
Pump designation : PES4MW100/72ORS1519  
EP type number : 0 413 204 013  
Governor  
Governor design. : RQV300...1300MW132-3  
Governor no. : 0 420 083 296

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kW : 77.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness : 8.00X2.50X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)

Rack travel in mm : 21.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.5...11.6

Del.quantity cm<sup>3</sup>/ : 9.4...9.6

100 s: (9.2...9.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.1

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.75...1.65)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.66...1.16

2nd speed rpm : 629

travel mm : 2.9...3.4

3rd speed rpm : 800

travel mm : 3.75...4.25

4th speed rpm : 1140

travel mm : 5.63...6.13

5th speed rpm : 1345

travel mm : 7.39...7.89

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1400

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 94.0...96.0

1000 : (92.0...98.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 106...114

### Testing:

1st rack travel in: 10.5  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 65...73

### Testing:

Speed rpm : 200  
Minimum rack travel: 4.50  
Speed rpm : 300  
Rack travel in mm : 3.9...4.1

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.5...11.6

## Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.6...10.8  
2nd pressure hPa : 500  
Rack travel in m: 11.0...11.2

## START CUT-OUT

Speed 1/min : 200 (220)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 94.0...96.0  
1000 s: (92.0...98.0)  
Spread cm3 : 3.50  
1000 s: (6.00)  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 85.5...88.5  
1000 s: (83.0...91.0)

Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 65.0...67.0  
1000 s: (63.0...69.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...135.0  
1000 s: (122.0...138.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.9...4.1  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB6,11  
Edition : 09.02.94  
Replaces : 03.92  
Test oil : ISO-4113  
Combination no. : 0 403 246 031  
Injection pump  
Pump designation : PES6MW100/720RS1515  
EP type number : 0 413 206 013  
Governor  
Governor design. : RQV300...1300MW125-4  
Governor no. : 0 420 083 284

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 127.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 9.9...10.1  
100 s: (9.7...10.3)

Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 3.9...4.2  
Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.60...9.00  
2nd speed rpm : 880  
travel mm : 4.90...5.10  
3rd speed rpm : 500  
travel mm : 2.70...3.30  
4th speed rpm : 300  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 1000  
Del.quantity : 99.0...101.0  
1000 : (97.0...103.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.50

Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.05

#### Testing:

Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 3.90...4.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.70...8.90  
2nd pressure hPa : 300  
Rack travel in m: 9.40...9.6000  
3rd pressure hPa : 500  
Rack travel in m: 10.80...11.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 99.0...101.0  
1000 s: (97.0...103.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 90.5...93.5  
1000 s: (88.0...96.0)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 35.0...37.0  
1000 s: (33.0...39.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.90...4.20  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 I 1  
Edition : 09.02.94  
Replaces : 06.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 246 032  
  
Injection pump  
Pump designation : PES6MW100/720RS1515  
EP type number : 0 413 206 013  
Governor  
Governor design. : RQV300...1300MW125-5  
Governor no. : 0 420 083 285

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 142.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300  
Rack travel in mm : 12.50...12.60  
Del. quantity cm<sup>3</sup>/ : 11.0...11.2  
100 s: (10.8...11.4)

Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 4.2...4.4  
Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.60...9.00  
2nd speed rpm : 880  
travel mm : 4.90...5.10  
3rd speed rpm : 500  
travel mm : 2.70...3.30  
4th speed rpm : 300  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 1100  
Del. quantity : 110.0...112.0  
1000 : (108.0...114.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 120...128

Testing:  
1st rack travel in: 11.50

Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.3

#### Testing:

Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1100  
Rack travel mm : 12.50...12.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.10  
2nd pressure hPa : 250  
Rack travel in m: 9.70...9.90  
3rd pressure hPa : 500  
Rack travel in m: 11.45...11.65

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1300  
Del.quantity cm3/ : 110.0...112.0  
1000 s: (108.0...114.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm3/ : 105.0...108.0  
1000 s: (102.5...111.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 37.0...39.0  
1000 s: (35.0...41.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 10.02.94  
Replaces : 07.92  
Test oil : ISO-4113

Combination no. : 0 403 246 033

Injection pump  
Pump designation : PES6MW100/720RS1511  
EP type number : 0 413 206 011  
Governor  
Governor design. : RQV300...1300MW125-6  
Governor no. : 0 420 083 286

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM366LA

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.1...4.3

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.60...9.00

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1400

Del.quantity : 115.0...117.0

1000 : (113.0...119.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1400  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 6.60...6.80  
2nd pressure hPa : 300  
Rack travel in m: 7.20...7.40  
3rd pressure hPa : 900  
Rack travel in m: 11.90...12.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1300  
Del.quantity cm3/ : 115.0...117.0  
1000 s: (113.0...119.0)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm3/ : 114.5...117.5  
1000 s: (112.0...120.0)

Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.10...4.30  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 10.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 246 034  
  
Injection pump  
Pump designation : PES6MW100/720RS1517  
EP type number : 0 413 206 015  
Governor  
Governor design. : RQV300...1300MW132  
Governor no. : 0 420 083 291

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.10...14.20

Del. quantity cm<sup>3</sup>/ : 12.8...13.0

100 s: (12.5...13.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.1

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.82...1.32

2nd speed rpm : 555

travel mm : 4.06...4.56

3rd speed rpm : 720

travel mm : 4.61...5.11

4th speed rpm : 1100

travel mm : 6.27...6.77

5th speed rpm : 1355

travel mm : 8.21...8.71

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1400

Del. quantity : 128.0...130.0

1000 : (125.0...133.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 114...122

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.0

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 3.90...4.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1400  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 500  
Rack travel in m: 10.60...10.80  
3rd pressure hPa : 850  
Rack travel in m: 13.10...13.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1300  
Del.quantity cm3/ : 128.0...130.0  
1000 s: (125.0...133.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm3/ : 128.0...132.0  
1000 s: (125.0...135.0)

Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 44.0...46.0  
1000 s: (42.0...48.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...145.0  
1000 s: (132.0...148.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.90...4.10  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 246 035  
Injection pump  
Pump designation : PES6MW100/720RS1517-1  
EP type number : 0 413 206 017  
Governor  
Governor design. : RQV300...1300MW132-2  
Governor no. : 0 420 083 293

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 125.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)

Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.95...12.05

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 4.0...4.2

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.77...1.27

2nd speed rpm : 490

travel mm : 2.0...2.5

3rd speed rpm : 710

travel mm : 2.78...3.28

4th speed rpm : 1100

travel mm : 4.51...5.01

5th speed rpm : 1353

travel mm : 6.45...6.95

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control Lever

position degrees: 112...120

Testing:

1st rack travel in: 11.0

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1455...1485

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 67...75

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 4.1

Testing:

Speed rpm : 200

Minimum rack travel: 5.00

Speed rpm : 300

Rack travel in mm : 4.0...4.2

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 1200

Rack travel mm : 11.95...12.05

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.8...9.7

2nd pressure hPa : 150

Rack travel in m: 10.25...10.45

3rd pressure hPa : 300

Rack travel in m: 11.25...11.45

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1300

Del.quantity cm3/ : 101.0...103.0

1000 s: (99.0...105.0)

Spread cm3 : 3.50

1000 s: (6.0)

Aneroid pressure h: 1000

Speed rpm : 750

Del.quantity cm3/ : 91.5...94.5

1000 s: (89.0...97.0)

Spread cm3 : 5.50

1000 s: (7.00)

Aneroid pressure h: 1000

Speed rpm : 600

Del.quantity cm3/ : 93.5...96.5

1000 s: (91.0...99.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 52.0...54.0

1000 s: (50.0...56.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.0

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 110.0...120.0

1000 s: (107.0...123.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.0...4.2

Del.quantity cm3/ : 10.0...14.0

1000 s: (7.5...16.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 246 036  
  
Injection pump  
Pump designation : PES6MW100/720RS1517  
EP type number : 0 413 206 015  
Governor  
Governor design. : RQV300...1300MW132-4  
Governor no. : 0 420 083 299

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 155.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.45...13.55

Del. quantity cm<sup>3</sup>/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.1

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.77...1.27

2nd speed rpm : 490

travel mm : 2.0...2.5

3rd speed rpm : 710

travel mm : 2.78...3.28

4th speed rpm : 1100

travel mm : 4.51...5.01

5th speed rpm : 1353

travel mm : 6.45...6.95

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del. quantity : 118.0...120.0

1000 : (116.0...122.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 114...122

Testing:  
1st rack travel in: 12.5  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1470...1500  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.0

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 3.9...4.1

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.45...13.55

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.1...10.3  
2nd pressure hPa : 300  
Rack travel in m: 10.7...10.9  
3rd pressure hPa : 600  
Rack travel in m: 12.5...12.7

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 118.0...120.0  
1000 s: (116.0...122.0)  
Spread cm3 : 3.50  
1000 s: (6.0)  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 117.5...120.5  
1000 s: (115.0...123.0)

Spread cm3 : 5.50  
1000 s: (7.00)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 117.5...120.5  
1000 s: (115.0...123.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 50.0...52.0  
1000 s: (48.0...54.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.5  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...135.0  
1000 s: (122.0...138.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.9...4.1  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER  
Edition : 10.02.94  
Replaces : 09.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 436 114  
  
Injection pump  
Pump designation : PES6MW100/320/3RS119  
4-1  
EP type number : 0 413 406 221  
Governor  
Governor design. : RGV300...1300MW108K  
Governor no. : 0 420 083 998

Customer-spec. information  
Customer : PERKINS

Engine : 180 TI

1st version kW : 134.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
: (3.25...3.45)

Rack travel in mm : 12.00...14.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.10...14.20

Del.quantity cm3/ : 13.25...13.45

100 s: (12.95...13.75)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 10.00...10.40

2nd speed rpm : 900  
travel mm : 6.40...6.60

3rd speed rpm : 480  
travel mm : 3.10...3.70

4th speed rpm : 300  
travel mm : 1.40...1.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 132.5...134.5

1000 : (129.5...137.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 118...126

Testing:

1st rack travel in: 13.15

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1470...1500

4th rack travel in: 1600

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 70...78

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.6

Testing:

Speed rpm : 200

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.50...6.70

## CONSTANT REGULATION

Speed rpm : 330...500

## TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 14.10...14.20

2nd speed rpm : 800

Rack travel in m: 13.10...13.30

3rd speed rpm : 500

Rack travel in m: 11.60...11.80

4th speed rpm : 1000

Rack travel in m: 13.45...13.75

5th speed rpm : 700

Rack travel in m: 12.60...12.90

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 1300

Pressure hPa : 900

Rack travel mm : 14.10...14.20

Measurement

Speed 1/min : 1300

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 180

Rack travel in m: 10.40...10.50

3rd pressure hPa : 220

Rack travel in m: 11.05...11.35

## START CUT-OUT

Speed 1/min : 240 (250)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1300

Del.quantity cm3/ : 132.5...134.5

1000 s: (129.5...137.5)

Spread cm3 : 4.00

1000 s: (7.5)

Aneroid pressure h: 900

Speed rpm : 800

Del.quantity cm3/ : 124.0...128.0

1000 s: (121.0...131.0)

Spread cm3 : 6.0

1000 s: (9.0)

Aneroid pressure h: 900

Speed rpm : 500

Del.quantity cm3/ : 106.0...110.0

1000 s: (103.0...113.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 61.0...63.0

1000 s: (59.0...65.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.15

Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...92.0

1000 s: (75.0...95.0)

Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.50...6.70

Del.quantity cm3/ : 14.0...18.0

1000 s: (11.5...20.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:  
Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 444 151  
Injection pump  
Pump designation : PES4MW100/720RS1235  
EP type number : 0 413 404 121  
Governor  
Governor design. : RQV300...1300MW139  
Governor no. : 0 420 083 304

Customer-spec. information  
Customer : MB

Engine : OM364A

1st version kW : 79  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.65...3.75  
: (3.6...3.8)  
Rack travel in mm : 19...21

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.65...12.75

Del.quantity cm<sup>3</sup>/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.75...7.95

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.02...1.52

2nd speed rpm : 390

travel mm : 2.14...2.64

3rd speed rpm : 550

travel mm : 3.31...3.81

4th speed rpm : 1354

travel mm : 10.06...10.56

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 113...121

Speed rpm : 1430

Rack travel in mm : 9.5...10.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 9.8  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77

Testing:  
Speed rpm : 200  
Minimum rack trave: 9.5  
Speed rpm : 300  
Rack travel in mm : 7.75...7.95

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.1...12.2  
2nd pressure hPa : 150  
Rack travel in m: 12.55...12.75  
3rd pressure hPa : 210  
Rack travel in m: 12.95...13.15

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 1300  
Del.quantity cm3/ : 82.0...84.0  
1000 s: (80.0...86.0)  
Spread cm3 : 3.50  
1000 s: (6.00)  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 75.0...78.0  
1000 s: (72.5...80.5)

Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.8  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.75...7.95  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 16.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 444 152  
Injection pump  
Pump designation : PES4MW100/720RS1235  
EP type number : 0 413 404 121  
Governor  
Governor design. : RQV300...1300MW140  
Governor no. : 0 420 083 305

Customer-spec. information  
Customer : MB

Engine : OM364A

1st version kW : 79  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.65...3.75  
: (3.6...3.8)  
Rack travel in mm : 19...21

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.65...12.75

Del.quantity cm3/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.75...7.95

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.02...1.52

2nd speed rpm : 390

travel mm : 2.14...2.64

3rd speed rpm : 510

travel mm : 3.31...3.81

4th speed rpm : 1354

travel mm : 10.06...10.56

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 113...121

Speed rpm : 1430

Rack travel in mm : 9.5...10.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 10.7  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1405...1435  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77

Testing:  
Speed rpm : 200  
Minimum rack travel: 9.5  
Speed rpm : 300  
Rack travel in mm : 7.75...7.95  
Rack travel in mm : 2.0  
Speed rpm : 495...555

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.4...13.5

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.1...12.2  
2nd pressure hPa : 150  
Rack travel in m: 12.55...12.75  
3rd pressure hPa : 210  
Rack travel in m: 12.95...13.15

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 1300  
Del.quantity cm3/ : 82.0...84.0  
1000 s: (80.0...86.0)  
Spread cm3 : 3.50  
1000 s: (6.00)  
Aneroid pressure h: 700  
Speed rpm : 600

C03

Del.quantity cm3/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.75...7.95  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: M3 #0240742702

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 15.02.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 153  
 Injection pump  
 Pump designation : PES4MW100/720RS1127  
 EP type number : 0 413 404 103  
 Governor  
 Governor design. : RQV300...1300MW48-3  
 Governor no. : 0 420 083 110

Customer-spec. information  
 Customer : MB

Engine : OM364A

1st version kW : 85  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.7...3.8  
 : (3.65...3.85)  
 Rack travel in mm : 9...12

CO4

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.1...11.2

Del.quantity cm<sup>3</sup>/ : 8.0...8.2

100 s: (7.8...8.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...7.9

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.15...1.65

2nd speed rpm : 363

travel mm : 1.8...2.3

3rd speed rpm : 490

travel mm : 2.68...3.18

4th speed rpm : 1345

travel mm : 8.34...8.84

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Del.quantity : 80.0...82.0

1000 : (78.0...84.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version



Control lever  
position degrees: 108...116

Testing:

1st rack travel in: 10.1  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 75...83

Testing:

Speed rpm : 200  
Minimum rack travel: 9.5  
Speed rpm : 300  
Rack travel in mm : 7.8...7.9

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 80.0...82.0  
1000 s: (78.0...84.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (6.00)  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 76.0...78.0  
1000 s: (74.0...80.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)  
Speed rpm : 585  
Del.quantity cm<sup>3</sup>/ : 71.5...74.5  
1000 s: (69.0...77.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.1  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

C05

Speed rpm : 300  
Rack travel in mm : 7.8...7.9  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 10.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 320  
  
Injection pump  
Pump designation : PES6MW100/720RS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RQV300...1300MW67-8  
Governor no. : 0 420 083 290

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1350

travel mm : 8.60...8.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 109...117

Testing:

1st rack travel in: 9.50

Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.20...11.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 300  
Rack travel in m: 9.70...9.90  
3rd pressure hPa : 400  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 1300  
Del.quantity cm3/ : 88.0...90.0  
1000 s: (86.0...92.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 700  
Speed rpm : 850  
Del.quantity cm3/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -

C07

Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...90.0  
1000 s: (77.0...93.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 321  
Injection pump  
Pump designation : PES6MW100/720RS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RGV300...1300MW50-31  
Governor no. : 0 420 083 294

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.15...1.65

2nd speed rpm : 510

travel mm : 4.03...4.53

3rd speed rpm : 710

travel mm : 4.91...5.41

4th speed rpm : 1354

travel mm : 8.03...8.43

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 116...124

Testing:

1st rack travel in: 9.50

Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 84...92  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.20...11.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 300  
Rack travel in m: 9.70...9.90  
3rd pressure hPa : 400  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 1300  
Del.quantity cm3/ : 88.0...90.0  
1000 s: (86.0...92.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 700  
Speed rpm : 850  
Del.quantity cm3/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...90.0  
1000 s: (77.0...93.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 324  
Injection pump  
Pump designation : PES6MW100/72ORS1131-  
1  
EP type number : 0 413 406 165  
Governor  
Governor design. : RQV300...1300MW136  
Governor no. : 0 420 083 300

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 177.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.6...3.7  
: (3.55...3.75)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.4...14.5

Del.quantity cm3/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.89...1.39

2nd speed rpm : 578

travel mm : 4.46...4.96

3rd speed rpm : 640

travel mm : 4.85...5.35

4th speed rpm : 1355

travel mm : 9.93...10.43

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 110...118

Testing:

1st rack travel in: 13.4  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.5...6.7

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.4...14.5

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.95...11.05  
2nd pressure hPa : 200  
Rack travel in m: 11.25...11.45  
3rd pressure hPa : 500  
Rack travel in m: 13.95...14.15

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 114.0...116.0  
1000 s: (112.0...118.0)  
Spread cm3 : 3.50  
1000 s: (6.0)  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 104.5...107.5  
1000 s: (102.0...110.0)  
Spread cm3 : 5.00  
1000 s: (7.00)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...43.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.4  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.5...6.7  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 0  
Edition : 16.02.94  
Replaces : 04.89  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 104  
  
Injection pump  
Pump designation : PES6MW100/321RS1180  
EP type number : 0 413 406 163  
Governor  
Governor design. : RQ250/1200MW84-1  
Governor no. : 0 420 082 037

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH

1st version kW : 157.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.6...11.7

Del.quantity cm3/ : 12.6...12.8

100 s: (12.3...13.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.8...2.2

100 s: (1.55...2.45)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 8.6...9.0

2nd speed rpm : 1260

travel mm : 6.5...6.7

3rd speed rpm : 350

travel mm : 3.4...4.0

4th speed rpm : 250

travel mm : 1.5...2.1

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 126.0...128.0

1000 : (123.0...131.0)

Spread cm3 : 4.00

1000 : (7.50)



## RATED SPEED

1st version  
Control lever  
position degrees: 26...34

### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 10.6  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1305...1335  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 6...14  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.3

### Testing:

Speed rpm : 100  
Minimum rack travel: 7.3  
Speed rpm : 250  
Rack travel in mm : 5.2...5.4

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.6...11.7

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.40  
2nd pressure hPa : 200  
Rack travel in m: 9.6...9.7  
3rd pressure hPa : 400  
Rack travel in m: 10.9...11.2

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 123.0...127.0  
1000 s: (120.0...130.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 125.0...129.0  
1000 s: (122.0...132.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.6  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.2...5.4  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN #2-7986

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 Q  
 Edition : 16.02.94  
 Replaces : 11.89  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 105  
 Injection pump  
 Pump designation : PES6MW100/321RS1186  
 EP type number : 0 413 406 168  
 Governor  
 Governor design. : RQ250/1200MW84-2  
 Governor no. : 0 420 082 040

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LUH

1st version kW : 157.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.7...14.8

Del.quantity cm3/ : 12.6...12.8

100 s: (12.3...13.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.9...2.3

100 s: (1.65...2.55)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280

travel mm : 9.5...9.9

2nd speed rpm : 1250

travel mm : 7.5...7.7

3rd speed rpm : 350

travel mm : 5.2...5.8

4th speed rpm : 250

travel mm : 2.3...2.7

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 14.7...16.3

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 126.0...128.0

1000 : (123.0...131.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 38...46

Setting point:  
Speed rpm : 600  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 13.8  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.5  
Speed rpm : 250  
Rack travel in mm : 5.4...5.6

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.8...14.9

Measurement:  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in mm : 12.2...12.3  
2nd pressure hPa : 200  
Rack travel in mm : 12.7...12.8  
3rd pressure hPa : 400  
Rack travel in mm : 13.8...14.1

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 126.0...128.0  
1000 s: (123.0...131.0)

Spread cm<sup>3</sup> : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 126.0...130.0  
1000 s: (123.0...133.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 126.0...130.0  
1000 s: (123.0...133.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 13.8  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.4...5.6  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7008

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 R  
 Edition : 16.02.94  
 Replaces : 11.89  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 106  
 Injection pump  
 Pump designation : PES6MW100/321RS1190  
 EP type number : 0 413 406 176  
 Governor  
 Governor design. : RQ250/1300MW84  
 Governor no. : 0 420 082 029

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LF

1st version kw : 165.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.2...3.4)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.9...15.0

Del.quantity cm3/ : 13.3...13.5

100 s: (13.0...13.8)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.9...2.3

100 s: (1.65...2.55)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1440

travel mm : 8.7...9.1

2nd speed rpm : 1360

travel mm : 6.3...6.5

3rd speed rpm : 380

travel mm : 4.1...4.7

4th speed rpm : 250

travel mm : 1.5...1.9

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 133.0...135.0

1000 : (130.0...138.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 33...37

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20

Testing:  
1st rack travel in: 13.9  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1530  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.4...5.6

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.9...15.0

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.9...12.0  
2nd pressure hPa : 180  
Rack travel in m: 12.6...12.7  
3rd pressure hPa : 385  
Rack travel in m: 13.7...14.0

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 133.0...135.0  
1000 s: (131.0...138.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 132.0...136.0  
1000 s: (129.0...139.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 133.0...137.0  
1000 s: (130.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.9  
Speed rpm : 1345...1360

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7020

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 V  
Edition : 16.02.94  
Replaces : 11.91  
Test oil : ISO-4113

Combination no. : 0 403 456 110

Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-3  
Governor no. : 0 420 082 043

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.8...12.9

Del.quantity cm3/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.8...2.0

100 s: (1.75...2.45)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 8.4...8.8

2nd speed rpm : 1260

travel mm : 6.6...6.8

3rd speed rpm : 345

travel mm : 4.0...4.6

4th speed rpm : 250

travel mm : 1.8...2.2

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 18.2...19.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 92...100

### Setting point:

Speed rpm : 600  
Rack travel in mm : 19

### Testing:

1st rack travel in: 11.3  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1290...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

### Testing:

Speed rpm : 100  
Minimum rack travel: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.4...5.6

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.65...12.95

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.0...10.1  
2nd pressure hPa : 155  
Rack travel in m: 10.3...10.4  
3rd pressure hPa : 550  
Rack travel in m: 11.9...12.2

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 141.0...143.0  
1000 s: (138.0...146.0)

Spread cm<sup>3</sup> : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 139.0...143.0  
1000 s: (136.0...146.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 136.0...140.0  
1000 s: (133.0...143.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.3  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.4...5.6  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7035

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 Q  
Edition : 16.02.94  
Replaces : 08.91  
Test oil : ISO-4113  
Combination no. : 0 403 456 111  
Injection pump  
Pump designation : PES6MW100/321RS1186  
EP type number : 0 413 406 186  
Governor  
Governor design. : RQ250/1200MW84-4  
Governor no. : 0 420 082 044

Customer spec. information  
Customer : MAN

Engine : D 0826 LUH

1st version kW : 157.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.7...12.8

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s: (13.0...13.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.65...2.35)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280

travel mm : 9.5...9.9

2nd speed rpm : 1250

travel mm : 7.5...7.7

3rd speed rpm : 350

travel mm : 5.2...5.8

4th speed rpm : 250

travel mm : 2.2...2.6

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 14.7...16.3

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 133.0...135.0

1000 : (130.0...138.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)



## RATED SPEED

1st version  
Control lever  
position degrees: 104...112

Setting point:  
Speed rpm : 600  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 11.5  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1290...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.5...5.7

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.8...12.9

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.0...10.1  
2nd pressure hPa : 200  
Rack travel in m: 10.3...10.4  
3rd pressure hPa : 500  
Rack travel in m: 12.0...12.3

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 133.0...135.0  
1000 s: (130.0...138.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 131.5...135.5  
1000 s: (128.5...138.5)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 129.5...133.5  
1000 s: (126.5...136.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.5  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.5...5.7  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7008

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 A  
Edition : 16.02.94  
Replaces : 08.91  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 112  
  
Injection pump  
Pump designation : PES6MW100/321RS1190  
EP type number : 0 413 406 176  
Governor  
Governor design. : RQ250/1100MW84-5  
Governor no. : 0 420 082 046

Customer-spec. information  
Customer : MAN

Engine : D 0826 LOH05

1st version kW : 150.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.2...3.4)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.7...14.8

Del.quantity cm3/ : 13.2...13.4

100 s: (12.9...13.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.9...2.3

100 s: (1.65...2.35)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.3...9.7

2nd speed rpm : 1100

travel mm : 7.3...7.5

3rd speed rpm : 470

travel mm : 6.7...7.3

4th speed rpm : 250

travel mm : 1.4...1.8

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 16.0...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 132.0...134.0

1000 : (129.0...137.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 96...104

### Setting point:

Speed rpm : 600  
Rack travel in mm : 16.9

### Testing:

1st rack travel in: 13.7  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

### Testing:

Speed rpm : 100  
Minimum rack travel: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.4...5.6

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.7...14.9

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.0...12.1  
2nd pressure hPa : 250  
Rack travel in m: 12.6...12.7  
3rd pressure hPa : 450  
Rack travel in m: 13.75...13.95

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)

Spread cm<sup>3</sup> : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (127.5...137.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 131.0...138.0  
1000 s: (128.0...138.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.7  
Speed rpm : 1145...1160

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.4...5.6  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7115

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 C  
Edition : 16.02.94  
Replaces : 06.91  
Test oil : ISO-4113

Combination no. : 0 403 456 113

Injection pump  
Pump designation : PES6MW100/321RS1210  
EP type number : 0 413 406 201  
Governor  
Governor design. : RQ250/1050MW84-6  
Governor no. : 0 420 082 049

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH250

1st version kW : 184.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.0...14.1

Del.quantity cm3/ : 16.1...16.3

100 s: (15.8...16.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.3...1.7

100 s: (1.05...1.95)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1125

travel mm : 7.3...7.7

2nd speed rpm : 1050

travel mm : 6.1...6.3

3rd speed rpm : 400

travel mm : 5.7...6.3

4th speed rpm : 250

travel mm : 2.5...2.9

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1100

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.0  
Speed rpm : 1075...1090  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.5  
Speed rpm : 250  
Rack travel in mm : 4.9...5.1

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1100  
Rack travel mm : 14.0...14.1

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.2...9.3  
2nd pressure hPa : 150  
Rack travel in m: 9.5...9.6  
3rd pressure hPa : 700  
Rack travel in m: 12.8...13.1

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 800  
Del.quantity cm3/ : 161.0...163.0  
1000 s: (158.0...166.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1100  
Speed rpm : 600  
Del.quantity cm3/ : 161.5...165.5  
1000 s: (158.5...168.5)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm3/ : 157.5...161.5  
1000 s: (154.5...164.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 67.0...69.0  
1000 s: (65.0...71.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.0  
Speed rpm : 1075...1090

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.9...5.1  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7127

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D  
Edition : 16.02.94  
Replaces : 12.92  
Test oil : ISO-4113

Combination no. : 0 403 456 115

Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-7  
Governor no. : 0 420 082 055

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH01

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.2...14.3

Del.quantity cm3/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 6.8...7.2

Del.quantity cm3/ : 2.8...3.2

100 s: (2.55...3.45)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.3...9.7

2nd speed rpm : 1255

travel mm : 6.5...6.7

3rd speed rpm : 360

travel mm : 3.9...4.5

4th speed rpm : 250

travel mm : 1.6...2.0

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1400

Del.quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.2  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 7.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.5  
Speed rpm : 250  
Rack travel in mm : 6.8...7.2

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1400  
Rack travel mm : 14.2...14.3

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.0...10.2  
2nd pressure hPa : 270  
Rack travel in m: 10.5...10.7  
3rd pressure hPa : 850  
Rack travel in m: 13.4...13.6

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1000  
Del.quantity cm3/ : 170.0...172.0  
1000 s: (167.0...175.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1400  
Speed rpm : 600  
Del.quantity cm3/ : 176.0...180.0  
1000 s: (173.0...183.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1400  
Speed rpm : 1200  
Del.quantity cm3/ : 165.0...169.0  
1000 s: (162.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 78.0...80.0  
1000 s: (76.0...82.0)

## BREAKAWAY

1st version  
1mm rack travel less in  
full load rack tr: 7.2  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.8...7.2  
Del.quantity cm3/ : 28.0...32.0  
1000 s: (25.5...34.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7126

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D 1  
Edition : 16.02.94  
Replaces : 03.93  
Test oil : ISO-4113  
Combination no. : 0 403 456 116  
Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-8  
Governor no. : 0 420 082 063

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF 04

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.05...14.25

Del.quantity cm3/ : 16.75...16.95

100 s: (16.45...17.25)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 2.1...2.5

100 s: (1.85...2.75)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.3...9.7

2nd speed rpm : 1255

travel mm : 6.5...6.7

3rd speed rpm : 360

travel mm : 3.9...4.5

4th speed rpm : 250

travel mm : 1.6...2.0

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 167.5...169.5

1000 : (164.5...172.5)

Spread cm3 : 4.00

1000 : (7.50)



## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.6  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.5  
Speed rpm : 250  
Rack travel in mm : 5.5...5.7

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.6...13.7

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.5...9.6  
2nd pressure hPa : 200  
Rack travel in m: 10.0...10.1  
3rd pressure hPa : 700  
Rack travel in m: 12.3...12.6

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 167.5...169.5  
1000 s: (164.5...172.5)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 174.0...178.0  
1000 s: (171.0...181.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 163.0...167.0  
1000 s: (160.0...170.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.0...79.0  
1000 s: (75.0...81.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.6  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.5...5.7  
Del.quantity cm3/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7137

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 16.02.94  
Replaces : 08.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 119  
  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-10  
Governor no. : 0 420 082 065

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF08/LUH05

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 13.2...13.3

Del.quantity cm3/ : 14.8...15.0

100 s: (14.5...15.3)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.35...2.25)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 8.4...8.8

2nd speed rpm : 1260

travel mm : 6.6...6.8

3rd speed rpm : 345

travel mm : 4.0...4.6

4th speed rpm : 250

travel mm : 1.8...2.2

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 18.2...19.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 148.0...150.0

1000 : (145.0...153.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 92...100

Setting point:  
Speed rpm : 600  
Rack travel in mm : 19.0

Testing:  
1st rack travel in: 11.8  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.4...5.6

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.2...13.3

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.0...10.1  
2nd pressure hPa : 150  
Rack travel in m: 10.3...10.4  
3rd pressure hPa : 550  
Rack travel in m: 11.9...12.2

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 148.0...150.0  
1000 s: (145.0...153.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 143.0...147.0  
1000 s: (140.0...150.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 147.0...151.0  
1000 s: (144.0...154.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.8  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7219

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 6,2 F  
Edition : 16.02.94  
Replaces : 09.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 120  
  
Injection pump  
Pump designation : PES6MW100/321RS1210  
EP type number : 0 413 406 201  
Governor  
Governor design. : RQ250/1050MW84-11  
Governor no. : 0 420 082 066

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH06

1st version kW : 184.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.0...14.1

Del.quantity cm3/ : 16.1...16.3

100 s: (15.8...16.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 1.3...1.7

100 s: (1.05...1.95)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1125

travel mm : 7.3...7.7

2nd speed rpm : 1050

travel mm : 6.1...6.3

3rd speed rpm : 400

travel mm : 5.7...6.3

4th speed rpm : 250

travel mm : 2.5...2.9

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1100

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 99...107

### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 13.00  
Speed rpm : 1075...1090  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.1

### Testing:

Speed rpm : 100  
Minimum rack travel: 6.5  
Speed rpm : 250  
Rack travel in mm : 5.0...5.2

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1100  
Rack travel mm : 14.0...14.1

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.4...9.5  
2nd pressure hPa : 150  
Rack travel in m: 9.7...9.8  
3rd pressure hPa : 700  
Rack travel in m: 13.2...13.5

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1100  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 161.0...163.0  
1000 s: (158.0...166.0)

Spread cm<sup>3</sup> : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1100  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 161.0...165.0  
1000 s: (158.0...168.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 155.0...159.0  
1000 s: (152.0...162.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 67.0...69.0  
1000 s: (65.0...71.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.0  
Speed rpm : 1075...1090

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.0...5.2  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

### Remarks:

: MAN #3-7220

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 6,2 F  
Edition : 16.02.94  
Replaces : 09.92  
Test oil : ISO-4113  
Combination no. : 0 403 456 121  
Injection pump  
Pump designation : PES6MW100/321RS1186  
EP type number : 0 413 406 168  
Governor  
Governor design. : RQ250/1200MW84-12  
Governor no. : 0 420 082 067

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH03

1st version kW : 157.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)

Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.7...12.8

Del.quantity cm3/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.9...2.3

100 s: (1.65...2.55)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280

travel mm : 9.5...9.9

2nd speed rpm : 1250

travel mm : 7.5...7.7

3rd speed rpm : 350

travel mm : 5.2...5.8

4th speed rpm : 250

travel mm : 2.2...2.6

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 14.7...16.3

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 104...112

### Setting point:

Speed rpm : 600  
Rack travel in mm : 15.5

### Testing:

1st rack travel in: 11.50  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.6

### Testing:

Speed rpm : 100  
Minimum rack travel: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.5...5.7

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.8...12.9

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.0...10.1  
2nd pressure hPa : 200  
Rack travel in m: 10.3...10.4  
3rd pressure hPa : 500  
Rack travel in m: 12.0...12.3

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 133.0...135.0  
1000 s: (131.0...137.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 131.5...135.5  
1000 s: (128.5...138.5)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 129.5...133.5  
1000 s: (126.5...136.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.5  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.5...5.7  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

### Remarks:

: MAN #3-7221

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 16.02.94  
Replaces : 10.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 122  
  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 150  
Governor  
Governor design. : RQ250/1200MW84-13  
Governor no. : 0 420 082 068

Customer-spec. information  
Customer : MAN

Engine : D 0826 LFD8

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.8...12.9

Del.quantity cm<sup>3</sup>/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.35...2.25)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.56...1.76

2nd speed rpm : 359

travel mm : 3.6...3.8

3rd speed rpm : 520

travel mm : 6.9...7.1

4th speed rpm : 912

travel mm : 6.98...7.18

5th speed rpm : 1257

travel mm : 7.51...7.71

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 14.7...16.3

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0

1000 : (138.0...146.0)



Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 98...106

#### Setting point:

Speed rpm : 600  
Rack travel in mm : 15.5

#### Testing:

1st rack travel in: 11.3  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.4...5.6

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.7...12.9

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.3...10.4  
2nd pressure hPa : 150  
Rack travel in m: 10.6...10.7  
3rd pressure hPa : 550  
Rack travel in m: 12.2...12.5

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 800

Del.quantity cm3/ : 141.0...143.0  
1000 s: (138.0...146.0)

Spread cm3 : 4.00  
1000 s: (7.5)

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 138.0...142.0  
1000 s: (135.0...145.0)

Spread cm3 : 6.00  
1000 s: (9.00)

Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 137.0...141.0  
1000 s: (134.0...143.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.3  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7239

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 16.02.94  
Replaces : 12.92  
Test oil : ISO-4113  
Combination no. : 0 403 456 123  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-14  
Governor no. : 0 420 082 069

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF02/LF06

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.8...12.9

Del.quantity cm3/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.35...2.25)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.56...1.76

2nd speed rpm : 359

travel mm : 3.6...3.8

3rd speed rpm : 520

travel mm : 6.9...7.1

4th speed rpm : 912

travel mm : 6.98...7.18

5th speed rpm : 1257

travel mm : 7.51...7.71

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 14.7...16.3

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 101...109

Setting point:  
Speed rpm : 600  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 11.3  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.4...5.6

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.7...12.9

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.3...10.4  
2nd pressure hPa : 155  
Rack travel in m: 10.6...10.7  
3rd pressure hPa : 550  
Rack travel in m: 12.2...12.5

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 800

Del.quantity cm3/ : 141.0...143.0  
1000 s: (138.0...146.0)

Spread cm3 : 4.00  
1000 s: (7.5)

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 138.0...142.0  
1000 s: (135.0...145.0)

Spread cm3 : 6.00  
1000 s: (9.00)

Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 137.0...141.0  
1000 s: (134.0...143.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.3  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: : MAN #3-7240

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 456 126  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQV250/1200MW83-4  
Governor no. : 0 420 083 307

Customer-spec. information  
Customer : MAN

Engine : D 0826 LFL06

1st version kW : 162.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.65...12.75

Del.quantity cm3/ : 13.9...14.1

100 s: (13.6...14.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.6...2.0

100 s: (1.35...2.25)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.88...1.38

2nd speed rpm : 333  
travel mm : 1.78...2.28

3rd speed rpm : 440  
travel mm : 2.87...3.37

4th speed rpm : 807  
travel mm : 5.58...6.08

5th speed rpm : 1250  
travel mm : 10.19...10.69

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 125...129

Speed rpm : 1300

Rack travel in mm : 11.0...12.0

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 139.0...141.0

1000 : (136.0...144.0)

Spread cm3 : 4.00  
1000 : (7.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 11.20  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.60...5.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.65...12.75

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.95...10.05  
2nd pressure hPa : 155  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 550  
Rack travel in m: 12.00...12.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 139.0...141.0  
1000 s: (136.0...144.0)  
Spread cm3 : 4.00  
1000 s: (7.5)

Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 134.0...138.0  
1000 s: (131.0...141.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 135.0...139.0  
1000 s: (132.0...142.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7332

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 16.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 456 127  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-15  
Governor no. : 0 420 082 072

Customer-spec. information  
Customer : MAN

Engine : D 0826 LFL06

1st version, kw : 162.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.65...12.75

Del.quantity cm3/ : 13.9...14.1

100 s: (13.6...14.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.6...2.0

100 s: (1.35...2.25)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.43...1.63

2nd speed rpm : 364  
travel mm : 3.58...3.78

3rd speed rpm : 530  
travel mm : 6.9...7.1

4th speed rpm : 914  
travel mm : 6.98...7.18

5th speed rpm : 1262  
travel mm : 7.51...7.71

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 108...110

Speed rpm : 600

Rack travel in mm : 14.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 139.0...141.0

1000 : (136.0...144.0)

Spread cm3 : 4.00  
1000 s : (7.50)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 98...106

Setting point:  
Speed rpm : 600  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 11.2  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.0  
Speed rpm : 250  
Rack travel in mm : 5.6...5.8

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.65...12.75

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.95...10.05  
2nd pressure hPa : 155  
Rack travel in m: 10.3...10.4  
3rd pressure hPa : 550  
Rack travel in m: 12.0...12.3

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 800

Del.quantity cm3/ : 139.0...141.0  
1000 s: (136.0...144.0)  
Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 134.0...138.0  
1000 s: (131.0...141.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 135.0...142.0  
1000 s: (132.0...142.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.2  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.6...5.8  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7331

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CDC  
Edition : 16.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 466 133  
Injection pump  
Pump designation : PES6VW100/120RS1137  
EP type number : 0 413 406 131  
Governor  
Governor design. : RSV450...1100MW2A319  
-20  
Governor no. : 0 420 085 212

Customer-spec. information  
Customer : CDC

Engine : 6CTA-8.3L

1st version kW : 188.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 14.3...14.4  
Del.quantity cm3/ : 14.9...15.1  
100 s: (14.6...15.4)  
Spread cm3 : 0.4  
100 s: (0.7)

2nd speed rpm : 425.0  
Rack travel in mm : 7.2...7.4  
Del.quantity cm3/ : 1.9...2.3  
100 s: (1.65...2.55)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 2.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del.quantity : 149.0...151.0  
1000 : (146.0...154.0)  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 92...100

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1235...1265  
4th rack travel in: 1350



Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 68...76

Setting point w/out bumper spring

Speed rpm : 425

Rack travel in mm : 7.3

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.0

Speed rpm : 425

Rack travel in mm : 7.2...7.4

#### SET IDLE AUXILIARY SPRING

Speed rpm : 425

Rack travel in mm : 7.7...7.9

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1100

Del.quantity cm3/ : 149.0...151.0

1000 s: (146.0...154.0)

Spread cm3 : 4.00

1000 s: (7.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.3

Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 125.0...145.0

1000 s: (122.0...148.0)

#### LOW IDLE

Speed rpm : 425

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 19.0...23.0

1000 s: (16.5...25.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

: CDC #3921149

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CDC  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 466 139  
Injection pump  
Pump designation : PES6MW100/120RS1148  
EP type number : 0 413 406 143  
Governor  
Governor design. : RSV400...750MW7A319-  
25  
Governor no. : 0 420 085 217

Customer-spec. information  
Customer : CDC

Engine : 6CTA

1st version kW : 180.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 17.95...18.15

100 s: (17.65...18.45)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 1.6...1.8

100 s: (1.35...2.25)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 179.5...181.5

1000 : (176.5...184.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 90...98

Testing:

1st rack travel in: 12.0

Speed rpm : 790...800

2nd rack travel in: 4.00

Speed rpm : 815...845

4th rack travel in: 1000

Speed rpm : 0.30...1.30

#### LOW IDLE 1

Control lever

position degrees: 70...78

Setting point w/out bumper spring

Speed rpm : 400

Rack travel in mm : 6.10

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.0

Speed rpm : 400

Rack travel in mm : 6.00...6.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

#### START CUT-OUT

Speed 1/min : 100 (80)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750

Del.quantity cm3/ : 179.5...181.5

1000 s: (176.5...184.5)

Spread cm3 : 4.00

1000 s: (7.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.0

Speed rpm : 790...800

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 125.0...145.0

1000 s: (122.0...148.0)

#### LOW IDLE

Speed rpm : 400

Rack travel in mm : 6.00...6.20

Del.quantity cm3/ : 16.0...20.0

1000 s: (13.5...22.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

: CDC #3921083

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CDC  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 466 144  
Injection pump  
Pump designation : PES6MW100/120RS1137-  
1  
EP type number : 0 413 406 157  
Governor  
Governor design. : RSV450...1100MW2A319  
-29  
Governor no. : 0 420 085 226

Customer-spec. information  
Customer : CDC

Engine : 6CTA

1st version kW : 171.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 13.30...13.40  
Del.quantity cm<sup>3</sup>/ : 12.80...13.00  
100 s : (12.50...13.30)  
Spread cm<sup>3</sup> : 0.4  
100 s : (0.7)

2nd speed rpm : 450.0  
Rack travel in mm : 6.5...6.7  
Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
100 s : (1.55...2.45)  
Spread cm<sup>3</sup> : 0.3  
100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del.quantity : 128.0...130.0  
1000 : (125.0...133.0)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 101...109

Testing:  
1st rack travel in: 12.30  
Speed rpm : 1150...1170  
2nd rack travel in: 4.00

Speed rpm : 1260...1270  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 80...88  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 6.60

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.0  
Speed rpm : 450  
Rack travel in mm : 6.50...6.70

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1100  
Del.quantity cm3/ : 128.0...130.0  
1000 s: (125.0...133.0)  
Spread cm3 : 4.00  
1000 s: (7.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1150...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...140.0  
1000 s: (117.0...143.0)

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: CDC #3926218

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CDC  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 466 145

Injection pump  
Pump designation : PES6MW100/120RS1137-  
2

EP type number : 0 413 406 180  
Governor  
Governor design. : RSV550...1100MW2A319  
-28  
Governor no. : 0 420 085 225

Customer-spec. information  
Customer : CDC

Engine : 6CTA

1st version kW : 191.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 14.5...14.7

100 s: (14.2...15.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 550.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.75...2.15

100 s: (1.5...2.4)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Del.quantity : 145.0...147.0

1000 : (142.0...150.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

### 1st version

Control lever  
position degrees: 93...101

### Testing:

1st rack travel in: 13.40

Speed rpm : 1160...1170

2nd rack travel in: 4.00

Speed rpm : 1230...1240  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 71...79

Setting point w/out bumper spring

Speed rpm : 550

Rack travel in mm : 6.50

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.0

Speed rpm : 550

Rack travel in mm : 6.40...6.60

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 4.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1100

Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)

Spread cm3 : 4.00  
1000 s: (7.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.40

Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 120.0...140.0  
1000 s: (117.0...143.0)

#### LOW IDLE

Speed rpm : 550

Rack travel in mm : 6.40...6.60

Del.quantity cm3/ : 17.5...21.5  
1000 s: (15.0...24.0)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CDC #3925549

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CDC  
 Edition : 14.02.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 466 146  
 Injection pump  
 Pump designation : PES6MW100/120RS1137-  
 1  
 EP type number : 0 413 406 157  
 Governor  
 Governor design. : RSV500...1100MW2A335  
 -7  
 Governor no. : 0 420 085 235

Customer-spec. information  
 Customer : CDC

Engine : 6CTA

1st version kW : 172.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 13.15...13.35

100 s: (12.85...13.65)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 500

Rack travel in mm : 6.30...6.50

Del.quantity cm3/ : 1.9...2.3

100 s: (1.65...2.55)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 131.5...133.5

1000 : (128.5...136.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:

1st rack travel in: 12.30

Speed rpm : 1150...1170



2nd rack travel in: 4.00  
Speed rpm : 1260...1270  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 77...85  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 6.40

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 500  
Rack travel in mm : 6.30...6.50

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 4.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.40...14.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.35...11.55  
2nd pressure hPa : 275  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 425  
Rack travel in m: 13.10...13.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1100  
Del.quantity cm3/ : 131.5...133.5  
1000 s: (128.5...136.5)  
Spread cm3 : 4.00  
1000 s: (7.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...140.0  
1000 s: (117.0...143.0)

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: : CDC #3926219

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 10.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 037B  
  
Injection pump  
Pump designation : PES6MW100/720RS1130  
EP type number : 0 413 406 122  
Governor  
Governor design. : RSV350...1300MWOA318  
Governor no. : 0 420 085 052

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 112.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.10...10.30

Del.quantity cm3/ : 6.85...7.15

100 s: (6.7...7.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.0...8.2

Del.quantity cm3/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 68.5...71.5

1000 : (67.0...74.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 9.20

Speed rpm : 1220...1230

2nd rack travel in: 4.00

Speed rpm : 1280...1310

4th rack travel in: 1325

Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 75...83

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 8.1

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 350

Rack travel in mm : 8.00...8.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 2.00

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 10.10...10.30

2nd speed rpm : 800

Rack travel in m: 11.60...11.80

3rd speed rpm : 750

Rack travel in m: 11.60...11.80

4th speed rpm : 950

Rack travel in m: 11.50...11.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1200

Del.quantity cm3/ : 68.5...71.5

1000 s: (67.0...73.0)

Spread cm3 : 3.50

1000 s: (6.0)

Speed rpm : 800

Del.quantity cm3/ : 72.0...76.0

1000 s: (70.0...78.0)

Spread cm3 : 5.00

1000 s: (7.00)

Speed rpm : 750

Del.quantity cm3/ : 68.5...73.5

1000 s: (66.0...76.0)

Speed rpm : 900

Del.quantity cm3/ : 75.5...80.5

1000 s: (73.0...83.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.20

Speed rpm : 1220...1230

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...88.0

1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 8.00...8.20

Del.quantity cm3/ : 9.0...13.0

1000 s: (7.0...15.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 10.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 476 037C  
Injection pump  
Pump designation : PES6MW100/720RS1130  
EP type number : 0 413 406 122  
Governor  
Governor design. : RSV350...1300MWOA318  
Governor no. : 0 420 085 052

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 112.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 6.95...7.25

100 s: (6.8...7.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.0...8.2

Del.quantity cm3/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 69.5...72.5

1000 : (68.0...74.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 9.75

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1225

Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 75...83

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 8.1

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 350

Rack travel in mm : 8.00...8.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 2.00

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.70...10.80

2nd speed rpm : 750

Rack travel in m: 10.70...10.80

3rd speed rpm : 900

Rack travel in m: 10.65...10.85

4th speed rpm : 500

Rack travel in m: 10.65...10.85

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1100

Del.quantity cm3/ : 69.5...72.5

1000 s: (68.0...74.0)

Spread cm3 : 3.50

1000 s: (6.0)

Speed rpm : 750

Del.quantity cm3/ : 57.0...61.0

1000 s: (55.0...63.0)

Spread cm3 : 5.00

1000 s: (7.00)

Speed rpm : 900

Del.quantity cm3/ : 65.0...70.0

1000 s: (62.5...72.5)

Speed rpm : 500

Del.quantity cm3/ : 38.0...42.5

1000 s: (35.5...45.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.75

Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...88.0

1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 8.00...8.20

Del.quantity cm3/ : 9.0...13.0

1000 s: (7.0...15.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 10.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 0370  
  
Injection pump  
Pump designation : PES6MW100/720RS1130  
EP type number : 0 413 406 122  
Governor  
Governor design. : RSV350...1300MWOA318  
Governor no. : 0 420 085 052

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 112.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.45...11.55

Del.quantity cm3/ : 8.15...8.45

100 s: (8.0...8.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.0...8.2

Del.quantity cm3/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 81.5...84.5

1000 : (80.0...86.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 10.50

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1245...1275

4th rack travel in: 1350

Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control Lever

position degrees: 75...83

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 8.1

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 350

Rack travel in mm : 8.00...8.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 2.00

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.45...11.55

2nd speed rpm : 750

Rack travel in m: 11.95...12.05

3rd speed rpm : 950

Rack travel in m: 11.65...11.85

4th speed rpm : 500

Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1150

Del.quantity cm3/ : 81.5...84.5

1000 s: (80.0...86.0)

Spread cm3 : 3.50

1000 s: (6.0)

Speed rpm : 750

Del.quantity cm3/ : 75.5...79.5

1000 s: (73.5...81.5)

Spread cm3 : 5.00

1000 s: (7.00)

Speed rpm : 950

Del.quantity cm3/ : 79.0...84.0

1000 s: (76.5...86.5)

Speed rpm : 500

Del.quantity cm3/ : 65.5...70.5

1000 s: (63.0...73.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.50

Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...88.0

1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 8.00...8.20

Del.quantity cm3/ : 9.0...13.0

1000 s: (7.0...15.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 H 1  
 Edition : 14.02.94  
 Replaces : 05.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 080A  
 Injection pump  
 Pump designation : PES6MW100/720RS1191  
 EP type number : 0 413 406 179  
 Governor  
 Governor design. : RSV350...1300MWOA329  
 -6  
 Governor no. : 0 420 085 136

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 165.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.80...14.90

Del.quantity cm3/ : 12.20...12.40

100 s: (12.0...12.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 122.0...124.0

1000 : (120.0...126.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 13.85

Speed rpm : 1180...1190

2nd rack travel in: 4.00



Speed rpm : 1270...1310  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.80...14.90

##### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 12.10...12.30

2nd pressure hPa : 350

Rack travel in m: 12.90...13.10

3rd pressure hPa : 500

Rack travel in m: 13.90...14.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000

Speed rpm : 1150

Del.quantity cm3/ : 122.0...124.0  
1000 s: (120.0...126.0)

Spread cm3 : 3.50  
1000 s: (6.0)

Aneroid pressure h: 1000

Speed rpm : 600

Del.quantity cm3/ : 118.5...121.5  
1000 s: (116.0...124.0)

Spread cm3 : 5.00  
1000 s: (7.00)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 69.0...71.0  
1000 s: (67.0...73.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.85

Speed rpm : 1180...1190

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

#### Remarks:

:

\* Read off speed set under 1.  
Add 80...88 min-1 to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
 Edition : 14.02.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 134  
 Injection pump  
 Pump designation : PES6MW100/320RS1236  
 EP type number : 0 413 406 231  
 Governor  
 Governor design. : RSV325...750MW1A802-  
 3  
 Governor no. : 0 420 085 237

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LXE20  
 1st version kW : 151.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 196  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

E06

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)  
 Rack travel in mm : 14.0...16.0  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.60...13.80  
 Del.quantity cm3/ : 19.1...19.3  
 100 s: (18.8...19.6)  
 Spread cm3 : 0.4  
 100 s: (0.7)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 6.60...7.40  
 Del.quantity cm3/ : 6.3...6.7  
 100 s: (6.15...6.95)  
 Spread cm3 : 0.6  
 100 s: (0.9)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: -  
 Del.quantity : 191.0...193.0  
 1000 : (188.0...196.0)  
 Spread cm3 : 4.00  
 1000 : (7.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 84...92

Setting point:  
 Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 12.70

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 780...788

4th rack travel in: 950

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 64...72

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 7.0

Speed rpm : 325

Rack travel in mm : 6.60...7.40

Rack travel in mm : 2.00

Speed rpm : 310...370

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/ : 191.0...193.0  
1000 s: (188.0...196.0)

Spread cm3 : 4.00

1000 s: (7.5)

Speed rpm : 784

Del.quantity cm3/ : 18.0...22.0

1000 s: (15.5...24.5)

Spread cm3 : 3.50

1000 s: (6.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 205.0...225.0  
1000 s: (202.0...228.0)

LOW IDLE

Speed rpm : 325

Rack travel in mm : 6.60...7.40

Del.quantity cm3/ : 63.0...67.0

1000 s: (61.5...69.5)

Spread cm3 : 6.00

1000 s: (9.00)

Remarks:

: MAIN #3-7231

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 486 105  
  
Injection pump  
Pump designation : PES6MW100/321RS1231  
EP type number : 0 413 406 225  
Governor  
Governor design. : RSV300...1100MWOA343  
-1  
Governor no. : 0 420 085 209  
  
Customer-spec. information  
Customer : MAN  
  
Engine : D0826LE 522  
  
1st version kW : 154.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 047  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test lines : 1 680 750 008  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600  
  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
  
Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100  
  
Rack travel in mm : 12.00...12.10  
  
Del.quantity cm<sup>3</sup>/ : 14.2...14.4  
100 s: (13.9...14.7)  
  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)  
  
2nd speed rpm : 300.0  
Rack travel in mm : 4.9...5.1  
Del.quantity cm<sup>3</sup>/ : 0.9...1.3  
100 s: (0.6...1.5)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1000  
Del.quantity : 142.0...144.0  
1000 : (139.0...147.0)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 100...108

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.65

Testing:

1st rack travel in: 11.00  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 900  
Rack travel in m: 12.30...12.40  
3rd speed rpm : 600  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.30...12.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.50  
2nd pressure hPa : 150  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 600  
Rack travel in m: 11.60...11.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1100  
Del.quantity cm3/ : 142.0...144.0  
1000 s: (139.0...146.0)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1000  
Speed rpm : 900  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (141.0...151.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 148.0...152.0  
1000 s: (145.0...155.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 75.0...77.0  
1000 s: (73.0...79.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1150...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7263

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 486 106  
Injection pump  
Pump designation : PES6MW100/321RS1232  
EP type number : 0 413 406 226  
Governor  
Governor design. : RSV300...1150MWA343  
-2  
Governor no. : 0 420 085 210

Customer-spec. information  
Customer : MAN

Engine : D0826LE 523

1st version kW : 154.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 18...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 15.9...16.1

100 s: (15.6...16.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.3...1.7

100 s: (1.15...1.95)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1200

Del.quantity : 159.0...161.0

1000 : (156.0...164.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 12.00  
Speed rpm : 1200...1210  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.4...5.6

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150  
Rack travel in m: 13.0...13.10  
2nd speed rpm : 925  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.30...13.50  
4th speed rpm : 500  
Rack travel in m: 9.40...9.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.50  
2nd pressure hPa : 150  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 750  
Rack travel in m: 12.20...12.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1150

Del.quantity cm3/ : 159.0...161.0  
1000 s: (156.0...164.0)  
Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1200  
Speed rpm : 925  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 158.0...162.0  
1000 s: (155.0...165.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 75.0...77.0  
1000 s: (73.0...79.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1200...1210

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (11.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7262

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 14.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 486 107  
Injection pump  
Pump designation : PES6MW100/321RS1208  
EP type number : 0 413 406 199  
Governor  
Governor design. : RSV350...900MW1A360  
Governor no. : 0 420 085 238

Customer-spec. information  
Customer : MAN

Engine : D0826LE 101

1st version kW : 140.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 18...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 870

Rack travel in mm : 13.65...13.75

Del.quantity cm<sup>3</sup>/ : 13.7...13.9

100 s: (13.4...14.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 350.0

Rack travel in mm : 4.4...4.6

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.85...1.75)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 870

Del.quantity : 137.0...139.0

1000 : (134.0...142.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 87...95

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 12.70

Speed rpm : 915...925



2nd rack travel in: 4.00  
Speed rpm : 955...965  
4th rack travel in: 1050  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 4.4...4.6

#### SET IDLE AUXILIARY SPRING

Speed rpm : 500  
Rack travel in mm : 4.9...5.1

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 870  
Del.quantity cm3/ : 137.0...139.0  
1000 s: (134.0...142.0)  
Spread cm3 : 4.00  
1000 s: (7.5)  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...130.0  
1000 s: (123.0...133.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Speed rpm : 700  
Del.quantity cm3/ : 134.0...138.0  
1000 s: (131.0...141.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.4...4.6

Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7310

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 486 108  
Injection pump  
Pump designation : PES6MW100/321RS1208  
EP type number : 0 413 406 199  
Governor  
Governor design. : RSV350...900MW1A360-  
1  
Governor no. : 0 420 085 239

Customer-spec. information  
Customer : MAN

Engine : D0826LE 102

1st version kW : 154.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 18...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 870

Rack travel in mm : 14.75...14.85

Del.quantity cm<sup>3</sup>/ : 15.6...15.8

100 s: (15.3...16.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 350.0

Rack travel in mm : 4.4...4.6

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.85...1.75)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 870

Del.quantity : 156.0...158.0

1000 : (153.0...161.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 87...95

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 13.80

Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 965...975  
4th rack travel in: 1050  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control Lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 4.4...4.6

#### SET IDLE AUXILIARY SPRING

Speed rpm : 350  
Rack travel in mm : 4.9...5.1

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 870  
Del.quantity cm3/ : 156.0...158.0  
1000 s: (153.0...161.0)  
Spread cm3 : 4.00  
1000 s: (7.5)  
Speed rpm : 500  
Del.quantity cm3/ : 147.0...151.0  
1000 s: (144.0...153.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Speed rpm : 700  
Del.quantity cm3/ : 156.0...160.0  
1000 s: (153.0...163.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack travel: 13.80  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)

#### LOW IDLE

Speed rpm : 350

E15

Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7311

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 15.02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 486 109  
Injection pump  
Pump designation : PES6MW100/321RS1208  
EP type number : 0 413 406 199  
Governor  
Governor design. : RSV350...1000MW1A360  
-2  
Governor no. : 0 420 085 240

Customer-spec. information  
Customer : MAN

Engine : D0826LE 103

1st version kW : 161.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 18...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 970  
Rack travel in mm : 14.75...14.85  
Del.quantity cm3/ : 14.8...15.0  
100 s: (14.5...15.3)  
Spread cm3 : 0.4  
100 s: (0.7)

2nd speed rpm : 350.0  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 1.1...1.5  
100 s: (0.85...1.75)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 3.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 970  
Del.quantity : 148.0...150.0  
1000 : (145.0...153.0)  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 87...95

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.65

Testing:  
1st rack travel in: 13.80

Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1080...1090  
4th rack travel in: 1150  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 4.4...4.6

#### SET IDLE AUXILIARY SPRING

Speed rpm : 350  
Rack travel in mm : 4.9...5.1

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 970  
Del.quantity cm<sup>3</sup>/ : 148.0...150.0  
1000 s: (145.0...153.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.5)  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 139.0...143.0  
1000 s: (136.0...146.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 147.0...151.0  
1000 s: (145.0...153.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1020...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (127.0...153.0)

#### LOW IDLE

Speed rpm : 350

E17

Rack travel in mm : 4.4...4.6  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7312

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 085 362  
Injection pump  
Pump designation : PES6A100D32C/3RS2E27  
EP type number : 9 400 084 030  
Governor  
Governor design. : RQV350...1100AB1276R  
Governor no. : 9 420 080 354

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 160.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 3.50...4.50  
Difference ° CS : 2

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del. quantity cm3/ : 12.9...13.1

100 s: (12.7...13.3)

Spread cm3 : 0.3

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 4.9...5.1

Del. quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.5

100 s: (0.9)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1150

travel mm : 7.40...7.60

2nd speed rpm : 250

travel mm : 0.40...0.90

3rd speed rpm : 350

travel mm : 1.60...2.10

4th speed rpm : 600

travel mm : 4.00...4.50

5th speed rpm : 1350

travel mm : 9.10...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1240

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

#### 1st version

Speed rpm : 1100  
Aneroid pressure h: 1000  
Del. quantity : 129.0...131.0  
1000 : (127.0...133.0)  
Spread cm3 : 3.50  
1000 : (8.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 109...117

##### Setting point:

Speed rpm : 1240  
Rack travel in mm : 16.5

##### Testing:

1st rack travel in: 11.10  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.0

##### Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 700  
Rack travel in m: 12.10...12.20

Aneroid/Altitude  
Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.10...12.20

#### Measurement

Speed 1/min : 500  
2nd pressure hPa : 320  
Rack travel in m: 0.60...0.70  
3rd pressure hPa : 600  
Rack travel in m: 2.00...2.20

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del. quantity cm3/ : 133.5...137.5  
1000 s: (131.5...139.5)  
Speed rpm : 500  
Del. quantity cm3/ : 94.5...96.5  
1000 s: (92.5...98.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 164.0...180.0  
1000 s: (161.0...183.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.90...5.10  
Del. quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 5.50  
1000 s: (9.00)

#### Remarks:

: C..D.C. # 335 5245

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 087 481  
Injection pump  
Pump designation : PES6P120A320/3RS3264  
EP type number : 9 400 087 075  
Governor  
Governor design. : RQV350/870...900PA11  
11  
Governor no. : 9 420 080 356

Customer-spec. information  
Customer : CUMMINS

Engine : 6CTA

1st version kW : 207.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.45...3.55  
: (3.40...3.60)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 870

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 21.5...21.7

100 s: (21.2...22.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 0.7...1.3

100 s: (0.4...1.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 910  
travel mm : 5.50...6.00

2nd speed rpm : 250  
travel mm : 0.50...1.00

3rd speed rpm : 400  
travel mm : 2.50...3.00

4th speed rpm : 700  
travel mm : 4.40...4.60

5th speed rpm : 980  
travel mm : 8.60...9.10

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 945

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 870

Del.quantity : 215.0...217.0

1000 : (212.0...220.0)



Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 105...113

#### Setting point:

Speed rpm : 945  
Rack travel in mm : 16.5  
4th rack travel in: 1050  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 6.10...6.30

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 870  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 500  
Rack travel in m: 12.30...12.40

#### START CUT-OUT

Speed 1/min : 270 (290)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...295.0  
1000 s: (271.0...299.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 7.0...13.0  
1000 s: (4.0...16.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 335 5248  
Sliding sleeve pre-travel = 6.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 02.94  
Replaces : ..  
Test oil : ISO-4113

Combination no. : 9 400 087 482

Injection pump  
Pump designation : PES6P120A320/3RS3254  
EP type number : 9 400 087 075  
Governor  
Governor design. : RQV350/720...750PA11  
12  
Governor no. : 9 420 080 357

Customer-spec. information  
Customer : CUMMINS

Engine : 6CTA

1st version kW : 180.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.45...3.55  
: (3.40...3.60)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 720

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 820

travel mm : 8.00...8.50

2nd speed rpm : 300

travel mm : 0.80...1.30

3rd speed rpm : 420

travel mm : 3.10...3.60

4th speed rpm : 600

travel mm : 4.40...4.60

5th speed rpm : 770

travel mm : 8.00...8.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 805

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 720

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

Setting point:  
Speed rpm : 805  
Rack travel in mm : 16.5  
4th rack travel in: 900  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

#### CONSTANT REGULATION

Speed rpm : 300...430

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 720  
Rack travel in mm: 11.80...11.90  
2nd speed rpm : 500  
Rack travel in mm: 11.80...11.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...290.0  
1000 s: (266.0...294.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.0...18.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 335 5249  
Start-of-delivery mark/lock = 8.0°  
angular displacement of the cam after  
start of delivery of cylinder 1.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 02.9/  
replaces : 13.07.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L168-2  
Type number : 0 460 404 051  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 492 HT

Power KW: 76  
Speed 1/min: 2100

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 4.60...5.00

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 300  
Setting value bar: 4.80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 56.50...57.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 45.50...46.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 27.00...33.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...67.00  
mind 1000S.: 37.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
 Charge press hPa: -  
 Inj.-qty. cm3/  
 difference 1000s.: - 8.0...-14.0 "  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1500  
 Charge press hPa: -  
 TD-travel  
 difference mm: - 0.9...1.1 "  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
 Charge press hPa: 800  
 TD travel mm: 7.60...8.40  
 mm: (7.30...8.70)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1500  
 Charge press hPa: 800  
 TD travel mm: 4.60...5.00  
 mm: (4.10...5.50)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 800  
 TD travel mm: 1.60...2.40  
 mm: (1.30...2.70)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 6.90...7.50

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1500  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 4.80...5.40

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 600  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 1.80...2.40  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...86.20  
 quantity cm3/10s: (26.70...101.20)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 450  
 LDA-stroke mm: 6.1  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 52.00...53.00  
 1000s.: (50.00...55.00)

3rd speed 1/min: 2450  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 1.00...9.00  
 1000s.: (0.50...9.50)

5th speed 1/min: 2300  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 27.00...33.00  
 1000s.: (26.00...34.00)

9th speed 1/min: 2100  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 48.90...51.90  
 1000s.: (47.40...53.40)

12th speed 1/min: 1500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynntity cm3/: 56.50...57.50  
 1000s.: (55.00...59.00)

18th speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 45.50...46.50  
 1000s.: (43.50...48.50)

20th speed 1/min: 600  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 58.50...61.50  
1000S.: -

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...2.00  
1000S.: (0.00...2.00)

3rd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...8.50  
1000S.: (0.50...10.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: -3.0...-5.0 #  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Charge press. hPa: -  
Supply pump-  
pressure : -0.1...0.3 #  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...65.00  
1000S.: (45.00...65.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...57.00  
1000S.: (37.00...57.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...67.00  
1000S.: (37.00...67.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 0.6...1.0  
SVS max. mm: 2.3  
LDA stroke mm: 6.1  
XK mm: 17.0...19.0  
XL mm: 9.4...12.8

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 02.94  
replaces : 14.02.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F1600L352  
Type number : 0 460 404 061  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 494 HP

Power KW: 53  
Speed 1/min: 1600

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Setting value mm: 1.90...2.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Setting value bar: 4.80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Del. quantity cm3/  
1000S.: 43.50...44.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 11.50...15.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1650  
Del. quantity cm3/  
1000S.: 27.00...33.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 45.00...85.00  
mind 1000S.: 45.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Inj.-qty. cm3/  
difference 1000S.: - 10.0...-18.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1200  
TD-travel  
difference mm: -0.9...-1.1 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1600  
TD travel mm: 3.60...4.40  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 600  
Supply-pump  
pressure bar: 2.40...3.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Supply-pump  
pressure bar: 4.80...5.40

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1600  
Supply-pump  
pressure bar: 6.40...7.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.20  
quantity cm<sup>3</sup>/10s: (26.70...101.20)  
2nd speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...33.00  
1000S.: (24.00...36.00)

8th speed 1/min: 1625  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.50...41.50  
9th speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...40.00  
1000S.: (35.50...41.50)

12th speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.50...44.50  
1000S.: (41.00...47.00)  
20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.50...45.50  
1000S.: (41.00...47.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.50...15.50  
1000S.: (9.50...17.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 480  
Shutoff  
electromagnet Volt: 12



Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: (1.00...9.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Inj.-qty. cm<sup>3</sup>/ : -5.0...-7.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1200  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
1000S.: (50.00...80.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: (45.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.7...5.9  
MS mm: 0.6...1.0  
SVS max. mm: 1.3  
XK mm: 17.0...19.0  
XL mm: 14.2...17.6

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 02.94  
replaces : 03.12.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L414  
Type number : 0 460 404 068  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 425 CLI

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

F02

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 65.50...66.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 43.00...44.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 40.00...46.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 45.00...75.00  
mind 1000S.: 45.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: -28.0...-34.0 #

Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1500  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: -0.5...-0.7 #  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
 Charge press hPa: 1000  
 TD travel mm: 3.40...4.20  
 mm: (3.10...4.50)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.40...1.80  
 mm: (0.90...2.30)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 700  
 Charge press hPa: 1000  
 TD travel mm: 0.20...1.00  
 mm: (0.00...1.30)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 2100  
 Charge press. hPa: 1000  
 TD travel mm: 6.10...6.90  
 mm: (5.80...7.20)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.20...7.80

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.20...4.80

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 700  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.20...3.80

Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 350  
 LDA-stroke mm: 7.1  
 Shutoff

electromagnet Volt: 12  
 Del. quantity cm3/: 55.50...56.50  
 1000S.: (53.50...58.50)

3rd speed 1/min: 2550  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...8.00  
 1000S.: (0.00...8.00)

5th speed 1/min: 2300  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...46.00  
 1000S.: (39.00...47.00)

9th speed 1/min: 2100  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 63.00...66.00  
 1000S.: (61.50...67.50)

12th speed 1/min: 1500  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 65.50...66.50  
 1000S.: (64.00...68.00)

18th speed 1/min: 700  
 Charge press. hPa: -

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 43.00...44.00  
 1000S.: (41.00...46.00)

20th speed 1/min: 700

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.50...68.50  
1000S.: (64.00...70.00)

Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated  
temperatura

Del. quantity cm<sup>3</sup>/: 0.00...8.00  
1000S.: (0.00...8.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

3rd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...7.50  
1000S.: (2.00...8.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: -25.0...-27.0"  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500

Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.00...44.00  
1000S.: (41.00...46.00)

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.2...5.6  
MS mm: 0.6...1.0  
LDA stroke mm: 7.1  
XK mm: 38.8...40.8  
XL mm: 37.2...46.8

Ajustement Potentiometer:

Supply voltage  
pot. volt: 5.0  
Output volt  
pot. volt: 2.31

Operate control lever after each manifold-pressure compensator pressure change. :

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 02.94  
replaces : 02.08.93  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L414-1  
Type number : 0 460 404 073  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 425 CLIRS

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.20...1.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

F06

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.70...5.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 65.00...66.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 43.00...44.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 40.00...46.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 45.00...75.00  
mind 1000S.: 45.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Charge press hPa: -  
Inj.-qty. cm3/  
difference 1000S.: -13.0...-19.0 #

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
Charge press hPa: -  
TD-travel  
difference mm: -1.4...-1.6 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 1000  
TD travel mm: 7.30...8.10  
mm: (7.00...8.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.20...1.60  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: 4.00...4.80  
mm: (3.70...5.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.60...8.20

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.70...5.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 700  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 1000

F07

Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 54.00...55.00  
1000S.: (52.00...57.00)

3rd speed 1/min: 2550  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...8.00  
1000S.: (0.00...8.00)

5th speed 1/min: 2300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...46.00  
1000S.: (39.00...47.00)

9th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.50...64.50  
1000S.: (60.00...66.00)

12th speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.00...66.00  
1000S.: (63.50...67.50)

18th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.00...44.00  
1000S.: (41.00...46.00)

20th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.00...68.00  
1000S.: (63.50...69.50)

Mech. shutoff:

#### Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

3rd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.50...6.50  
1000S.: (1.00...7.00)

#### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/ : -7.0...-9.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Charge press. hPa: -  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 43.00...44.00  
1000S.: (41.00...46.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

#### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.2...5.6  
MS mm: 0.6...1.0  
SVS max. mm: 4.3  
LDA stroke mm: 7.0  
Ya mm: 38.8...40.8  
Yb mm: 36.2...45.8

#### Ajustement Potentiometer:

Supply voltage  
pot. volt: 5.0  
Output volt  
pot. volt: 2.31

#### Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end



Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2050R589  
Type number : 0 460 404 081  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.67

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1200  
Setting value mm: 2.00...2.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Setting value bar: 5.80...6.40  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1200  
Del. quantity cm3/  
1000S.: 41.50...42.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2,5  
1000S.: (2,5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 12.0...16.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2.5)

Full-load speed regulation

Speed 1/min: 2300  
Del. quantity cm3/  
1000S.: 31.00...35.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...110.00  
mind 1000S.: 70.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Inj.-qty. cm3/  
difference 1000S.: -15.0...-21.0 #  
Shutoff

electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1200

TD-travel  
difference mm: -0.7...-0.9 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1200  
TD travel mm: 2.00...2.20  
mm: (1.50...2.70)  
electromagnet Volt: 12  
2nd speed 1/min: 1600  
TD travel mm: 4.40...5.00  
mm: (4.00...5.40)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1800  
TD travel mm: 5.60...6.20  
mm: (5.20...6.60)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 2100  
TD travel mm: 7.00...7.80  
mm: (6.70...8.10)  
Shutoff  
electromagnet Volt: 12

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1200  
Supply-pump  
pressure bar: 5.80...6.40  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Supply-pump  
pressure bar: 8.30...8.90  
Shutoff  
electromagnet Volt: 12

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...137.90  
quantity cm<sup>3</sup>/10s: (41.70...152.90)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 41.50...42.50  
1000S.: (40.00...44.00)  
2nd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
3rd speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...21.0  
1000S.: -  
4th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...35.00  
1000S.: (27.00...39.00)  
5th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.50...41.50  
1000S.: (37.50...42.50)  
6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/: 40.00...43.00  
1000S.: (39.00...44.00)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 35.50...39.50  
1000S.: (34.50...40.50)

### Mech. shutoff:

### Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

### Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...16.00  
1000S.: (9.00...19.00)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (2.5)  
2nd speed 1/min: 465  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Inj.-qty. cm<sup>3</sup>/ : -13.0...-15.0"  
difference 1000S.: -

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 'Z  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
  
 TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1200  
 TD-travel : -0.7...-0.9 '  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12  
  
 SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1200  
 Supply pump-  
 pressure : -0.1...-0.3 "  
 difference bar: -  
  
 Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0  
  
 1st speed 1/min: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 19.5...20.5  
 1000S.: (17.5...22.5)  
  
 Automatic starting fuel delivery:  
  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...45.00  
 1000S.: -  
  
 2nd speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...85.00  
 1000S.: -  
  
 3rd speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...110.00  
 1000S.: -  
  
 Shutoff electromagnet:  
  
 Cut-in  
 min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.6...6.0
MS	mm: 1.7...1.9
Ya	mm: 42.8...44.8
Yb	mm: 62.4...70.8

Remarks:

;  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

Pump with slave plunger

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2050R591  
Type number : 0 460 404 082  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.67

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Setting value mm: 2.10...2.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Setting value bar: 6.00...6.60  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1200  
Del. quantity cm3/  
1000S.: 42.00...43.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2,5  
1000S.: (2,5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 12.0...16.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2.5)

Full-load speed regulation

Speed 1/min: 2300  
Del. quantity cm3/  
1000S.: 23.00...27.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...110.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Inj.-qty. cm3/  
difference 1000S.: -15.0...-21.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1200  
TD-travel  
difference mm: -0.7...-0.9 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1200  
TD travel mm: 2.10...2.30  
mm: (1.60...2.80)  
electromagnet Volt: 12  
2nd speed 1/min: 1600  
TD travel mm: 4.50...5.10  
mm: (4.10...5.50)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1800  
TD travel mm: 5.70...6.30  
mm: (5.30...6.70)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 2100  
TD travel mm: 7.00...7.80  
mm: (6.70...8.10)  
Shutoff  
electromagnet Volt: 12

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1200  
Supply-pump pressure bar: 6.00...6.60  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Supply-pump pressure bar: 8.50...9.10  
Shutoff  
electromagnet Volt: 12

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(27.80...97.30)  
2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...137.90  
(41.70...152.90)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 42.00...43.00  
1000S.: (40.50...44.50)  
2nd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
3rd speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...13.00  
1000S.: -  
4th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.00...27.00  
1000S.: (19.00...31.00)  
5th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 39.00...42.00  
1000S.: (38.00...43.00)  
6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/: 40.50...43.50  
1000S.: (39.50...44.50)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 35.50...39.50  
1000S.: (34.50...40.50)

### Mech. shutoff:

### Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

### Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...16.00  
1000S.: (9.00...19.00)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (2.5)  
2nd speed 1/min: 465  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Inj.-qty. cm<sup>3</sup>/: -13.0...-15.0"  
difference 1000S.: -

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 'Z  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
  
 TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1200  
 TD-travel : -0.7...-0.9 '  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12  
  
 SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1200  
 Supply pump-  
 pressure : -0.1...-0.3 "  
 difference bar: -  
  
 Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0  
  
 1st speed 1/min: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.5...33.5  
 1000S.: (29.0...34.0)  
  
 Automatic starting fuel delivery:  
  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...45.00  
 1000S.: -  
  
 2nd speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...85.00  
 1000S.: -  
  
 3rd speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...110.00  
 1000S.: -  
  
 Shutoff electromagnet:  
  
 Cut-in  
 min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.6...6.0
MS	mm: 1.6...2.0
Ya	mm: 42.9...44.9
Yb	mm: 31.7...39.7

Remarks:

:  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

Pump with slave plunger

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 02.94  
replaces : 19.12.86  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F2400L116-5  
Type number : 0 460 406 036  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 087 T

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value mm: 1.50...1.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 750  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 42.60...43.60  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 26.70...27.70  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2675  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 11.00...15.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
Charge press hPa: 750



TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press hPa: 750  
TD travel mm: 1.50...1.90  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 2400  
Charge press hPa: 750  
TD travel mm: 3.70...4.50  
mm: (3.40...4.80)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2400  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 8.00...8.60  
Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2400  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm<sup>3</sup>/10s: (41.70...153.90)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 4.8

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.50...34.50  
1000S.: (31.00...37.00)

2nd speed 1/min: 2850  
Charge press. hPa: 750  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 2675  
Charge press. hPa: 750  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...15.00  
1000S.: (9.00...17.00)

4th speed 1/min: 2575  
Charge press. hPa: 750  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...28.00  
1000S.: (17.00...29.00)

5th speed 1/min: 2400  
Charge press. hPa: 750  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.30...38.30  
1000S.: (35.10...39.50)

6th speed 1/min: 1500  
Charge press. hPa: 750  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.60...43.60  
1000S.: (40.90...45.30)

7th speed 1/min: 600  
Charge press. hPa: 750  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.50...38.50  
1000S.: (34.00...40.00)

8th speed 1/min: 600  
Charge press. hPa: -  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.70...27.70  
1000S.: (24.20...30.20)

#### Mech. shutoff:

#### Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 415

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)  
Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)  
2nd speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 430  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...30.00  
1000S.: -

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 6.3...6.7  
MS mm: 1.7...1.9  
SVS max. mm: 2.8  
LDA stroke mm: 4.8  
Ya mm: 8.5...10.5  
Yb mm: 71.0...89.6

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and

speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F1500R209-6  
Type number : 0 460 406 066  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : L 634 TA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 1.40...2.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 4.80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 55.50...56.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 42.50...43.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 14.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1640  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 20.00...24.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...92.00  
mind 1000S.: 42.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.diff.measurement:

Speed 1/min: 1100  
Charge press hPa: 800  
Inj.-qty. cm3/  
difference 1000S.: -8.50...-16.5 #

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1100  
Charge press hPa: 800  
TD-travel  
difference mm: -0.5...-0.7 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1400  
Charge press hPa: 800  
TD travel mm: 4.30...4.70  
mm: (3.80...5.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press hPa: 800  
TD travel mm: 2.70...3.30  
mm: (2.70...3.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
Charge press hPa: 800  
TD travel mm: 1.40...2.20  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 2.30...2.90  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1100  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 3.80...4.40  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 1400  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 4.70...5.40  
Shutoff  
electromagnet Volt: 12

Overlow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 800

F20

Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (27.80...97.30)  
2nd speed 1/min: 1500  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm3/10s: (41.70...153.90)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 48.00...49.00  
1000S.: (46.30...50.80)

2nd speed 1/min: 1740  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...6.00  
1000S.: (0.00...6.00)

3rd speed 1/min: 1640  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 20.00...24.00  
1000S.: (18.00...26.00)

4th speed 1/min: 1580  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 43.00...51.00  
1000S.: -

5th speed 1/min: 1500  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 52.50...55.50  
1000S.: (51.70...56.30)

6th speed 1/min: 1400  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 55.50...56.50  
1000S.: (53.70...58.30)

7th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.50...43.50  
1000S.: (40.70...45.30)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.00...18.00  
1000S.: (12.00...20.00)

Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1100  
Charge press. hPa: 800  
Inj.-qty. cm<sup>3</sup>/: -5.0...-7.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1100  
Charge press. hPa: 800  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...42.00  
1000S.: -

2nd speed 1/min: 220  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...92.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...92.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.8...6.2
MS	mm: 0.8...1.2
SVS max.	mm: 1.9
LDA stroke	mm: -
Ya	mm: 30.8...34.8
Yb	mm: 64.2...78.8

Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW  
Edition : 02.94  
replaces : 07.93  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F2150L398  
Type number : 0 460 406 075  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2.4L SD

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 4.40...4.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 6.00...6.60  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 29.50...30.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2325  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...65.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -8.00...-12.00#  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
TD-travel  
difference mm: -0.60...-0.80#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

2nd speed 1/min: 1700  
TD travel mm: 5.10...5.90  
mm: (4.80...6.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
TD travel mm: 4.40...4.80  
mm: (3.90...5.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 1.80...2.60  
mm: (1.50...2.90)

Shutoff  
electromagnet Volt: 12

### Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 3.80...4.40  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump  
pressure bar: 6.00...6.60  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2150  
Supply-pump  
pressure bar: 7.90...8.50  
Shutoff

electromagnet Volt: 12

### Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2150  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm<sup>3</sup>/10s: (41.70...153.90)

### Delivery-quant. and breakaway char.:

2nd speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 2325  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)  
8th speed 1/min: 2275  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.50...24.50  
1000S.: (13.50...25.50)

9th speed 1/min: 2150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 21.50...23.50  
1000S.: (20.30...24.70)

10th speed 1/min: 1850  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.20...25.80  
1000S.: (21.50...27.50)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.50...30.50  
1000S.: (27.80...32.20)

20th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.00...29.00  
1000S.: (24.50...30.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)  
2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: -6.5...-8.5  
difference 1000S.: -

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 0.0...3.0 Z "  
difference 1000S.: -

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -1.1...-1.5 "  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: (35.00...75.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...35.00  
1000S.: (15.00...35.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 6.3...6.7  
MS mm: 1.3...1.7  
Ya mm: 31.5...33.5  
Yb mm: 51.2...63.4

Remarks:

Yb = Distance between V<sub>E</sub> flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 2.94  
replaces : 04.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/11F1250L163-1  
Type number : 0 460 413 002  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8035.06.200 "DI"

Power KW: 38  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): ±0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 2.80...3.20

F25

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 65.00...66.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 15.50...19.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1350  
Del. quantity cm3/  
1000S.: 42.00...47.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...130.00  
mind 1000S.: 80.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
TD travel mm: 4.40...5.20  
mm: (4.10...5.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD travel mm: 2.80...3.20  
mm: (2.30...3.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 800  
 TD travel mm: 1.10...1.90  
                     mm: (0.80...2.20)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 3.40...4.00  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Supply-pump pressure bar: 5.7...6.300  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 Supply-pump pressure bar: 6.80...7.40  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 4th speed 1/min: 1400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 4.00...16.00  
                     1000S.: (0.00...20.00)  
 5th speed 1/min: 1350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.00...47.00  
                     1000S.: (39.00...51.00)  
 8th speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 63.50...66.50  
                     1000S.: (62.00...68.00)  
 9th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 65.00...66.00  
                     1000S.: (62.50...68.50)  
 10th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 56.50...59.50  
                     1000S.: (55.00...61.00)  
 Mech. shutoff:  
 Mech. Abstellung:  
 1st speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12  
 Electr. shutoff:  
 1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.50...19.50  
                     1000S.: (13.50...21.50)  
 Dispersion cm<sup>3</sup>/: 3.5  
                     1000S.: (3.5)  
 2nd speed 1/min: 475  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 30.00...50.00  
                     1000S.: -  
 2nd speed 1/min: 150  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 90.00...140.00  
                     1000S.: -  
 4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...130.00

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation:

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.5...1.7
SVS max.	mm: 4.7
Ya	mm: 37.9...39.9
Yb	mm: 44.0...49.0

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE  
Edition : 2.94  
replaces : 12.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/11F1200R263-1  
Type number : 0 460 413 007  
Customer Part-No. :

Customer-specific information  
Customer : STEYR

Engine : WD311-85

Power KW: 41  
Speed 1/min: 1200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 5.80...6.20

Supply-pump pressure

F28

Speed 1/min: 1000  
Setting value bar: 6.20...6.80

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 78.00...79.00  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 11.00...15.00  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1300  
Del. quantity cm3/  
1000S.: 17.00...23.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 84.00...134.00  
mind 1000S.: 84.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
TD travel mm: 6.90...7.70  
mm: (6.60...8.00)  
3rd speed 1/min: 1000  
TD travel mm: 5.80...6.20  
mm: (5.30...6.70)  
4th speed 1/min: 500  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
Supply-pump  
pressure bar: 7.00...7.60  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 6.20...6.80  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 4.30...4.90

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...89.40)  
 2nd speed 1/min: 1200  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1350  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 1300  
 Del. quantity cm3/: 17.00...23.00  
 1000S.: (15.00...25.00)  
 3th speed 1/min: 1250  
 Del. quantity cm3/: 41.00...57.00  
 1000S.: (39.00...59.00)  
 9th speed 1/min: 1175  
 Del. quantity cm3/: 76.50...79.50  
 1000S.: (75.70...80.30)  
 12th speed 1/min: 1000  
 Del. quantity cm3/: 78.00...79.00  
 1000S.: (76.20...80.80)  
 20th speed 1/min: 500  
 Del. quantity cm3/: 72.50...75.50  
 1000S.: (71.50...76.50)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1175  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
 Del. quantity cm3/: 11.00...15.00  
 1000S.: (9.00...17.00)  
 Dispersion cm3/: 3.5  
 1000S.: (3.5)  
 2nd speed 1/min: 330  
 Del. quantity cm3/: 3.00...9.00  
 1000S.: (2.00...10.00)  
 3rd speed 1/min: 400  
 Del. quantity cm3/: 0.00...2.60  
 1000S.: (0.00...2.60)

Automatic starting fuel delivery:

1st speed 1/min: 170  
 Del. quantity cm3/: 84.00...134.00  
 1000S.: -

2nd speed 1/min: 270  
 Del. quantity cm3/: 37.00...73.00  
 1000S.: -

4th speed 1/min: 100  
 Del. quantity cm3/: 84.00...134.00  
 1000S.: -

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: 3.2...3.4  
 KF mm: 5.6...6.0  
 MS mm: 1.3...1.7  
 SVS max. mm: 5.0  
 XK mm: 17.0...19.0  
 XL mm: 12.6...16.0  
 Ya mm: 37.2...39.2  
 Yb mm: 50.1...58.3

Remarks:

:  
 :  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE  
Edition : 2.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/11F1200R263-4  
Type number : 0 460 413 010  
Customer Part-No. :

Customer-specific information  
Customer : STEYR

Engine : WD308.85 "DI"

Power KW: 35  
Speed 1/min: 1200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 5.00...5.40

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 5.70...6.30

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 64.00...65.00  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 17.00...21.00  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 31.00...39.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
mind 1000S.: 70.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
TD travel mm: 6.70...7.50  
mm: (6.40...7.80)  
3rd speed 1/min: 1000  
TD travel mm: 5.00...5.40  
mm: (4.50...5.90)  
4th speed 1/min: 500  
TD travel mm: 0.50...1.30  
mm: (0.20...1.60)

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
Supply-pump  
pressure bar: 6.50...7.10  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 5.70...6.30  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 3.90...4.50

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...89.40)  
 2nd speed 1/min: 1175  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1350  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 1250  
 Del. quantity cm3/: 31.00...39.00  
 1000S.: (29.00...41.00)  
 8th speed 1/min: 1220  
 Del. quantity cm3/: 45.00...65.00  
 1000S.: -  
 9th speed 1/min: 1175  
 Del. quantity cm3/: 61.00...64.00  
 1000S.: (59.70...65.30)  
 12th speed 1/min: 1000  
 Del. quantity cm3/: 64.00...65.00  
 1000S.: (62.00...67.00)  
 20th speed 1/min: 500  
 Del. quantity cm3/: 57.50...60.50  
 1000S.: (56.50...61.50)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1175  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
 Del. quantity cm3/: 17.00...21.00  
 1000S.: (15.00...23.00)  
 Dispersion cm3/: 3.5  
 1000S.: (3.5)  
 2nd speed 1/min: 330  
 Del. quantity cm3/: 9.00...15.00  
 1000S.: (8.00...16.00)  
 3rd speed 1/min: 400  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 170  
 Del. quantity cm3/: 70.00...120.00  
 1000S.: -

2nd speed 1/min: 270  
 Del. quantity cm3/: 25.00...55.00  
 1000S.: -

4th speed 1/min: 100  
 Del. quantity cm3/: 70.00...120.00  
 1000S.: -

Mounting and assembly dimensions:

Designation

K mm: 3.2...3.4  
 KF mm: 5.6...6.0  
 MS mm: 1.3...1.7  
 SVS max. mm: 5.0  
 Ya mm: 37.2...39.2  
 Yb mm: 48.0...56.4

Remarks:

:  
 :  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 02.94  
replaces : 12.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1350R257  
Type number : 0 460 414 039  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8040.25.200+220

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.4  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 3.80...4.20

Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 92.50...93.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 67.50...70.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 22.00...26.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 3.5  
1000S.: (4.0)

Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 34.00...40.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...140.00  
mind 1000S.: 90.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses



# Timing-device characteristic:

2nd speed 1/min: 1350  
 Charge press hPa: 1000  
 TD travel mm: 6.30...7.10  
 mm: (6.00...7.40)

Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 3.80...4.20  
 mm: (3.30...4.70)

Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 800  
 Charge press hPa: 1000  
 TD travel mm: 1.70...2.50  
 mm: (1.40...2.80)

Shutoff  
 electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.60...4.20  
 Shutoff

electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.70...6.30  
 Shutoff

electromagnet Volt: 24  
 4th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.00...7.60  
 Shutoff  
 electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...86.10  
 quantity cm<sup>3</sup>/10s: (26.70...101.10)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 500  
 Charge-air pressure-setting point hPa: 250  
 LDA-stroke mm: 4.4  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 79.00...80.00  
 1000S.: (75.50...83.50)

2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 34.00...40.00  
 1000S.: (31.00...43.00)

9th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 89.00...92.00  
 1000S.: (87.00...94.00)

12th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 92.50...93.50  
 1000S.: (89.50...96.50)

18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 67.50...70.50  
 1000S.: (65.50...72.50)

20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 88.00...91.00  
 1000S.: (86.50...92.50)

# Mech. shutoff: Mech. Abststellung:

1st speed 1/min: 1350  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24

# Electr. shutoff:

1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 22.00...26.00  
1000S.: (19.00...29.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (4.0)

2nd speed 1/min: 430

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 400

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 3.00...13.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 150

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 90.00...140.00  
1000S.: (90.00...140.00)

2nd speed 1/min: 250

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 90.00...140.00  
1000S.: (90.00...140.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5.1...5.5

MS mm: 1.2...1.6

SVS max. mm: 5.3

LDA stroke mm: 4.4

XK mm: 17.0...19.0

XL mm: 14.2...17.6

Ya mm: 37.9...39.9

Yb mm: 45.4...50.7

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1500R266  
Type number : 0 460 414 041  
Customer Part-No. : 2643H061

Customer-specific information  
Customer : PERKINS

Engine : 500 HYDROVAN

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.5  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1,47  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Setting value mm: 2.40...2.80  
Shutoff  
electromagnet Volt: 12

G07

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 33.00...34.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000S.: 11.00...15.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1700  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...13.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...100.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
TD travel mm: 3.70...4.50  
mm: (3.40...4.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
TD travel mm: 2.40...2.80  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 700

TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 12

5th speed 1/min: 1350

TD travel mm: 3.40...4.20  
mm: (3.10...4.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700

Supply-pump  
pressure bar: 3.50...4.10

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1100

Supply-pump  
pressure bar: 4.90...5.50

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1500

Supply-pump  
pressure bar: 6.40...7.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600

Shutoff  
electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1500

Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1750

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1700

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (5.00...15.00)

9th speed 1/min: 1500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 54.50...57.50  
1000S.: (53.00...59.00)

10th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 55.50...58.50  
1000S.: (54.00...60.00)

12th speed 1/min: 600

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 33.00...34.00  
1000S.: (31.00...36.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...15.00  
1000S.: (9.00...17.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 400

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...9.00  
1000S.: (1.50...10.50)

3rd speed 1/min: 460

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

Automatic starting fuel delivery:

1st speed 1/min: 300

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...52.00  
1000S.: (36.00...52.00)

2nd speed 1/min: 400

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.50...39.50  
1000S.: (24.50...39.50)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...100.00  
1000S.: (70.00...100.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: KOT

MS1 mm: 1.5...1.7

SVS max. mm: 3.5

Ya mm: 28.5...30.5

Yb mm: 59.7...70.1

Remarks:

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1400R39-2  
Type number : 0 460 414 063  
Customer Part-No. :

Customer-specific information  
Customer : DEUTZ

Engine : E 4 L913V

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Setting value mm: 3.60...4.00  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1000

G10

Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

## Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 60.5...63.5

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

## Full-load speed regulation

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 32.00...41.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 75.00...105.00  
mind 1000S.: 75.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1400  
TD travel mm: 5.40...6.20  
mm: (5.10...6.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD travel mm: 3.60...4.00  
mm: (3.10...4.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
TD travel mm: 0.10...0.90  
mm: (0.00...1.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1400  
Supply-pump pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Supply-pump pressure bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump pressure bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1670  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...1.60  
1000S.: -  
2nd speed 1/min: 1580  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...20.00  
1000S.: -  
3rd speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...41.00  
1000S.: -  
4th speed 1/min: 1400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.00...57.00  
1000S.: (52.00...58.00)  
5th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (59.50...64.50)

6th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.00...61.00  
1000S.: (55.00...62.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.0...17.0  
1000S.: (11.0...19.0)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)  
3rd speed 1/min: 420  
Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (4.00...12.00)  
4th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...1.60  
1000S.: -

Automatic starting fuel delivery:

2nd speed 1/min: 220  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...60.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.00...105.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.2...3.4  
KF mm: 5.0...5.4

MS mm: 1.1...1.5  
Ya mm: 35.2...37.2  
Yb mm: 49.0...57.0

Remarks:

⋮

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 02.94  
replaces : 07.10.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1500R266-3  
Type number : 0 460 414 090  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : 500 GR DI.T/C

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.5  
(from BDC): ±0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Setting value mm: 2.40...2.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1200  
Del. quantity cm3/  
1000S.: 61.50...62.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3,5  
1000S.: (3,5)

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 11.00...15.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

## Full-load speed regulation

Speed 1/min: 1600  
Del. quantity cm3/  
1000S.: 12.00...18.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...110.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1500  
TD travel mm: 3.70...4.50  
mm: (3.40...4.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
TD travel mm: 2.40...2.80  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 700  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1350  
TD travel mm: 3.40...4.20  
mm: (3.10...4.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700  
Supply-pump  
pressure bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Supply-pump  
pressure bar: 6.40...7.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 1650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...18.00  
1000S.: (9.00...21.00)  
9th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 59.50...62.50  
1000S.: (58.00...64.00)  
12th speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 61.50...62.50  
1000S.: (59.50...64.50)

15th speed 1/min: 600

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.50...29.50  
1000S.: (25.50...31.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...15.00  
1000S.: (9.00...17.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...9.00  
1000S.: (1.50...10.50)

3rd speed 1/min: 460  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.00...40.00  
1000S.: (24.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...110.00  
1000S.: (70.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: KOT  
MS mm: 0.7...1.1  
Ya mm: 28.5...30.5  
Yb mm: 62.4...72.6

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900R444  
Type number : 0 460 414 091  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.47.2785 "DI"

Power KW: 85  
Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000

Setting value mm: 2.00...2.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1750  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 58.00...59.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 25.00...26.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 22.00...28.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...90.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
 Charge press hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/  
 difference 1000S.: -27.0...-35.0 #  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1250  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: -0.6...-0.9 #  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
 Charge press hPa: 1000  
 TD travel mm: 3.60...4.40  
 mm: (3.30...4.70)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 Charge press hPa: 1000  
 TD travel mm: 2.00...2.40  
 mm: (1.50...2.90)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 0.20...1.00  
 mm: (0.00...1.40)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1900  
 Charge press. hPa: 1000  
 TD travel mm: 4.50...5.30  
 mm: (4.20...5.60)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.60...4.20  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.30...5.90  
 Shutoff  
 electromagnet Volt: 12

3rd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.60...8.20  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm<sup>3</sup>/10s: (60.00...134.50)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.30...180.70  
 quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 400  
 LDA-stroke mm: 6.7  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.00...44.00  
 1000S.: (39.50...47.50)

2nd speed 1/min: 2250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 22.00...28.00  
 1000S.: (20.50...29.50)

8th speed 1/min: 2000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 41.00...49.00  
 1000S.: (39.00...51.00)

9th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.00...63.00  
 1000S.: (57.00...64.00)

12th speed 1/min: 1750  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.00...59.00  
                   1000S.: (55.00...62.00)  
 15th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 52.50...57.50  
                   1000S.: (51.00...59.00)  
 18th speed 1/min: 550  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...26.00  
                   1000S.: (22.00...29.00)  
 20th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 49.50...58.50  
                   1000S.: (48.50...59.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 325  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 325  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
                   1000S.: (8.00...16.00)  
 Dispersion cm<sup>3</sup>/: 6.0  
                   1000S.: (6.5)

2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: -28.0...-30.0"  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Inj.-qty. cm<sup>3</sup>/: +2.0...+8.0"  
 difference 1000S.: -

Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 TD-travel : -0.60...-1.40"  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : -0.10...-0.30"  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...105.00  
                   1000S.: (55.00...105.00)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 14.00...30.00  
                   1000S.: (14.00...30.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...90.00  
                   1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: KOT  
 MS mm: 1.7...1.9  
 SVS max. mm: 0.9  
 LDA stroke mm: 6.7  
 Ya mm: 37.9...39.9  
 Yb mm: 44.9...50.3

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ROVER  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2000R462  
Type number : 0 460 414 093  
Customer Part-No. :

Customer-specific information  
Customer : LANDROVER

Engine : GEMINI EGR "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 116

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.40  
mm: -

Outlet : C

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600  
Charge press. hPa: 1000  
Setting value mm: 3.30...3.70  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1600  
Charge press hPa: 1000  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 63.10...64.10

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 34.50...35.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.0  
1000S.: (4.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 52.30...58.30  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...130.00  
mind 1000S.: 80.00  
Shutoff  
electromagnet Volt: 12



Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 5.90...6.70  
mm: (5.40...7.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1600  
Charge press hPa: 1000  
TD travel mm: 3.30...3.70  
mm: (2.70...4.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1200  
Charge press hPa: 1000  
TD travel mm: 0.00...1.60  
mm: (0.00...1.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.40...8.00  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.10...6.70  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.00...5.60  
Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...100.08  
quantity cm<sup>3</sup>/10s: (40.60...115.08)

2nd speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 83.40...166.80  
quantity cm<sup>3</sup>/10s: (68.40...181.80)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.10...54.10  
1000S.: (50.40...56.80)

2nd speed 1/min: 2600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...15.50  
1000S.: (4.50...16.50)

5th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.30...58.30  
1000S.: (50.30...60.30)

9th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.10...64.10  
1000S.: (58.90...65.30)

10th speed 1/min: 1800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (58.50...65.50)

12th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 63.10...64.10  
1000S.: (60.80...66.40)

16th speed 1/min: 800  
Charge press. hPa: -  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 39.50...43.50  
1000H.: (38.00...45.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.50...35.50  
1000S.: (31.80...38.20)

20th speed 1/min: 800

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.90...65.90  
1000S.: (59.40...67.40)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Part-load del. at 3rd inj. - qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement - ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.50...39.50  
1000S.: (34.50...42.50)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 82.00...132.00  
1000S.: (80.00...134.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...130.00  
1000S.: (80.00...130.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.4...3.6  
KF mm: KOT  
MS1 mm: 1.1...1.5  
SVS max. mm: 2.9  
LDA stroke mm: 7.0  
Ya mm: 42.3...46.3  
Yb mm: 49.0...50.0

Ajustement Potentiometer:

Supply voltage  
pot. volt: 5.0  
Output volt  
pot. volt: 2.5

Remarks:

:  
:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2250R482  
Type number : 0 460 414 094  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T 4.20 (V) ARF

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 4.00...4.40  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 800  
Setting value bar: 7.30...7.90  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 66.50...67.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 625  
Del. quantity cm3/  
1000S.: 29.50...30.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 9.00...11.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (4.0)

Full-load speed regulation

Speed 1/min: 2525  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 23.50...25.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...90.00  
mind 1000S.: 60.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 800  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press hPa: 800  
TD travel mm: 4.00...4.40  
mm: (3.60...4.80)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 800  
TD travel mm: 1.90...2.70  
mm: (1.60...3.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 800  
Charge press. hPa: 800  
TD travel mm: 1.50...3.50 B  
mm: (1.30...3.70)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 500  
Charge press. hPa: 800  
TD travel mm: 2.10...2.30 A  
mm: (1.40...3.00)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 6.00...6.60

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 7.30...7.90  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 8.30...8.90  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 625  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 75.00...119.50  
quantity cm<sup>3</sup>/10s: (60.00...134.50)  
2nd speed 1/min: 2250  
Charge press. hPa: 800  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 7.1  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.50...59.50  
1000S.: (55.50...62.50)  
3rd speed 1/min: 2625  
Charge press. hPa: 800  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...10.00  
 1000S.: (0.00...10.00)  
 5th speed 1/min: 2525  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 23.50...25.50  
 1000S.: (20.50...28.50)  
 9th speed 1/min: 2250  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...74.00  
 1000S.: (69.00...75.00)  
 12th speed 1/min: 1250  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 66.50...67.50  
 1000S.: (64.50...69.50)  
 18th speed 1/min: 625  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.50...30.50  
 1000S.: (27.00...33.00)  
 20th speed 1/min: 1000  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 69.50...72.50  
 1000S.: (67.50...74.50)  
 21th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 27.50...32.50  
 1000S.: (26.00...34.00)

Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated  
temperatura

Del. quantity cm<sup>3</sup>/: 0.00...10.00  
 1000S.: (0.00...10.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12

Idle delivery:

1st speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...11.00  
 1000S.: (6.00...14.00)

Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (4.0)

2nd speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000S.: (0.00...5.00)

Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0

1st speed 1/min: 800  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 17.50...18.50  
 1000S.: (15.50...20.50)

Automatic starting fuel delivery:

2nd speed 1/min: 350  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 20.00...40.00  
 1000S.: (20.00...40.00)

4th speed 1/min: 100

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...90.00  
1000S.: (60.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.3...3.5  
KF mm: KOT  
LDA stroke mm: 7.1  
Ya mm: 37.0...39.0  
Yb mm: 55.5...66.5

Adjustment Potentiometer:

Supply voltage  
pot. volt: 5.0  
Output volt  
pot. volt: 2.43

Remarks:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

A = KSB adjustment point  
B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900R494  
Type number : 0 460 414 097  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.47.2585 "DI"

Power KW: 85  
Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000

Setting value mm: 2.00...2.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1750  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 58.00...59.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 25.00...26.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 22.00...28.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...90.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
 Charge press hPa: 1000  
 Inj.-qty. cm3/  
 difference 1000S.: -27.0...-35.0 #  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1250  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: -0.7...-0.9 #  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
 Charge press hPa: 1000  
 TD travel mm: 3.60...4.40  
 mm: (3.30...4.70)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 Charge press hPa: 1000  
 TD travel mm: 2.00...2.40  
 mm: (1.50...2.90)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 0.20...1.00  
 mm: (0.00...1.30)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1900  
 Charge press. hPa: 1000  
 TD travel mm: 4.50...5.30  
 mm: (4.20...5.60)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.60...4.20  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.30...5.90  
 Shutoff  
 electromagnet Volt: 12

3rd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.60...8.20  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm3/10s: (60.00...134.50)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.30...180.70  
 quantity cm3/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 400  
 LDA-stroke mm: 7.1  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 43.00...44.00  
 1000S.: (39.50...47.50)

2nd speed 1/min: 2250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 22.00...28.00  
 1000S.: (20.50...29.50)

8th speed 1/min: 2000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 41.00...49.00  
 1000S.: (39.00...51.00)

9th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 58.00...63.00  
 1000S.: (57.00...64.00)

12th speed 1/min: 1750  
 Charge press. hPa: 1000



Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.00...59.00  
                   1000S.: (55.00...62.00)  
 15th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 52.50...57.50  
                   1000S.: (51.00...59.00)  
 18th speed 1/min: 550  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...26.00  
                   1000S.: (22.00...29.00)  
 20th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 49.50...58.50  
                   1000S.: (48.50...59.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 325  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 325  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
                   1000S.: (8.00...16.00)  
 Dispersion cm<sup>3</sup>/: 6.0  
                   1000S.: (6.5)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: -28.0...-30.0"  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000

Inj.-qty. cm<sup>3</sup>/: +2.0...+8.0'Z  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 TD-travel : -0.6...-1.4 '  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : -0.1...0.3 "  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...105.00  
                   1000S.: (55.00...105.00)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 14.00...30.00  
                   1000S.: (14.00...30.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...90.00  
                   1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: KOT  
 MS1 mm: 1.6...2.0  
 SVS max. mm: 5.2  
 LDA stroke mm: 7.1  
 Ya mm: 37.8...39.9  
 Yb mm: 44.9...50.3

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ROVER  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2000R509  
Type number : 0 460 414 098  
Customer Part-No. :

Customer-specific information  
Customer : LANDROVER 2.5 TDI

Engine : GEMINI 3 "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 116

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.54  
Outlet : C

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600

H03

Charge press. hPa: 1000  
Setting value mm: 3.50...3.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1600  
Charge press hPa: 1000  
Setting value bar: 6.50...7.10  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 66.50...67.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/ 3.0  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 36.00...37.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 8.00...12.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/ 4.0  
1000S.: (4.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 55.00...59.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/ 85.00...135.00  
mind 1000S.: 85.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications

## Test specifications in parentheses

### Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 5.20...6.00  
mm: (4.70...6.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1600  
Charge press hPa: 1000  
TD travel mm: 3.50...3.90  
mm: (2.90...4.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1200  
Charge press hPa: 1000  
TD travel mm: 1.10...1.90  
mm: (0.60...2.40)

Shutoff  
electromagnet Volt: 12

### Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.70...8.30

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.50...7.10

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.30...5.90

Shutoff  
electromagnet Volt: 12

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...100.00  
quantity cm<sup>3</sup>/10s: (40.60...115.00)

2nd speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 83.40...166.80  
quantity cm<sup>3</sup>/10s: (68.40...181.80)

### Delivery-quant. and breakaway char.:

H04

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 51.00...52.00  
1000S.: (48.30...54.70)

2nd speed 1/min: 2600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...17.00  
1000S.: (6.00...18.00)

5th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...59.00  
1000S.: (52.00...62.00)

9th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.00...68.00  
1000S.: (62.80...69.20)

12th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 66.50...67.50  
1000S.: (64.20...69.80)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...37.00  
1000S.: (33.30...39.70)

20th speed 1/min: 900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.60...66.60  
1000S.: (60.10...68.10)

### Mech. shutoff:

### Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 2nd speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet Volt: -  
 Idle delivery:  
 1st speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...12.00  
 1000S.: (5.00...15.00)  
 Dispersion cm<sup>3</sup>/: 4.0  
 1000S.: (4.5)  
 2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 90.00...140.00  
 1000S.: (90.00...140.00)  
 2nd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 30.00...70.00  
 1000S.: (30.00...70.00)  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 85.00...135.00  
 1000S.: (84.50...135.50)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: 3.2...3.4  
 KF mm: KOT  
 MS1 mm: 0.9...1.2  
 LDA stroke mm: 7.0  
 Ya mm: 42.3...46.3  
 Yb mm: 50.0...61.0

Remarks:

H05

:  
 :  
 Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

Permissible port/port scatter with  
 stop test, electrical = max. 5.0  
 ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ROVER  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2000R509-1  
Type number : 0 460 414 099  
Customer Part-No. :

Customer-specific information  
Customer : LANDROVER 2.5 TDI

Engine : GEMINI 3 "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 116

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.4  
mm: -

Outlet : C

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600  
Charge press. hPa: 1000  
Setting value mm: 3.50...3.90  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1600  
Charge press hPa: 1000  
Setting value bar: 6.50...7.10  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 66.50...67.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.0  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 36.00...37.00

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 8.00...12.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 4.0  
1000S.: (4.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 55.00...59.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 44.00...46.00 V  
mind 1000S.: 44.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 5.10...5.90  
mm: (4.60...6.40)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1600  
Charge press hPa: 1000  
TD travel mm: 3.10...3.50  
mm: (2.50...4.10)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1400  
Charge press hPa: 1000  
TD travel mm: 1.60...2.40  
mm: (1.10...2.90)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff

electromagnet Volt: 24  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.50...7.10  
Shutoff

electromagnet Volt: 24  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.80...6.40  
Shutoff

electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...100.00  
quantity cm<sup>3</sup>/10s: (40.60...115.00)

2nd speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 83.40...166.80  
quantity cm<sup>3</sup>/10s: (68.40...181.80)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 51.00...52.00  
1000S.: (48.30...54.70)

2nd speed 1/min: 2600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 7.00...17.00  
1000S.: (6.00...18.00)

5th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 55.00...59.00  
1000S.: (52.00...62.00)

9th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 64.00...68.00  
1000S.: (62.80...69.20)

12th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 66.50...67.50  
1000S.: (64.20...69.8)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 36.00...37.00  
1000S.: (33.30...39.70)

20th speed 1/min: 900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 61.60...66.60  
1000S.: (60.10...68.10)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet Volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 8.00...12.00  
1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

2nd speed 1/min: 500

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Part-load del. at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 38.00...40.00  
1000S.: (35.00...43.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 90.00...140.00  
1000S.: (90.00...140.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 97.0...99.0 "v"  
1000S.: (90.50...105.50)

4th speed 1/min: 100

H08

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 44.0...46.0 "L"  
1000S.: (37.50...52.50)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: KOT  
MS1 mm: 1.1...1.5  
LDA stroke mm: 7.0  
Ya mm: 42.3...46.3  
Yb mm: 50.0...61.0

Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Starting delivery check  
V = Speed-control lever in full-load  
position

Starting delivery check  
L = Speed-control lever in idle  
position

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEN  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900L519  
Type number : 0 460 414 101  
Customer Part-No. :

Customer-specific information  
Customer : PENTA

Engine : TAMO 31 "DI"

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1000  
Setting value bar: 6.40...7.00

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 56.50...57.50  
Dispersion cm<sup>3</sup>/  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 650  
Del. quantity cm<sup>3</sup>/  
1000S.: 35.00...36.00

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 11.00...15.00  
Del. quantity cm<sup>3</sup>/  
1000S.: (6.0)

Full-load speed regulation

Speed 1/min: 2150  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 19.00...25.00

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/  
mind 1000S.: 20.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1900  
Charge press hPa: 1000  
TD travel mm: 4.00...4.80  
mm: (3.70...5.10)

3rd speed 1/min: 1500  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

6th speed 1/min: 1700  
Charge press. hPa: 1000  
TD travel mm: 2.60...3.60  
mm: (2.40...3.80)

Supply-pump pressure characteristic:

1st speed 1/min: 1900  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.70...8.30  
 2nd speed 1/min: 1500  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.40...7.00  
 3rd speed 1/min: 750  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.80...4.40

Overflow quantity at overflow valve:

1st speed 1/min: 650  
 Charge press. hPa: -  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 900  
 Charge-air pressure-setting  
 point hPa: 300  
 LDA-stroke mm: 7.5  
 Del. quantity cm<sup>3</sup>/: 46.50...47.50  
 1000S.: (44.00...50.00)  
 2nd speed 1/min: 2250  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 2150  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 19.00...25.00  
 1000S.: (18.00...26.00)  
 9th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 53.50...56.50  
 1000S.: (52.00...58.00)  
 10th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 56.00...61.00  
 1000S.: -  
 12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 56.50...57.50  
 1000S.: (54.50...59.50)  
 18th speed 1/min: 650  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 35.00...36.00  
 1000S.: (32.50...37.50)  
 20th speed 1/min: 750  
 Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/: 56.00...61.00  
 1000S.: -

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1900  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Electr. shutoff:

1st speed 1/min: 300  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

Idle delivery:

1st speed 1/min: 300  
 Del. quantity cm<sup>3</sup>/: 11.00...15.00  
 1000S.: (8.00...18.00)

Dispersion cm<sup>3</sup>/: 6.0  
 1000S.: (6.0)

2nd speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 250  
 Del. quantity cm<sup>3</sup>/: 17.00...29.00  
 1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 300  
 Del. quantity cm<sup>3</sup>/: 60.00...100.00  
 1000S.: (60.00...100.00)

2nd speed 1/min: 500  
 Del. quantity cm<sup>3</sup>/: 20.00...50.00  
 1000S.: (20.00...50.00)

4th speed 1/min: 100  
 Del. quantity cm<sup>3</sup>/: 20.00...70.00  
 1000S.: (20.00...70.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: -

KF	mm: KOT
MS	mm: 1.1...1.5
SVS max.	mm: 7.5
Ya	mm: 37.2...39.2
Yb	mm: 53.0...61.0

Remarks:

:  
Operate control lever after each manifold-pressure compensator pressure change.

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE4/11F1900R521  
Type number : 0 460 414 102  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.27.2585 "D1"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 453 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 1200  
Setting value mm: 2.90...3.10  
Shutoff  
electromagnet volt: 12

H12

## Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 1200  
Setting value bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1750  
Charge press. hPa: 1200  
Del. quantity cm3/  
1000S.: 50.50...51.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 26.00...27.00  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 8.00...12.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

## Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1200  
Del. quantity cm3/  
1000S.: 33.00...37.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...90.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

## Load-dependent start of delivery: Inj.-qty.dif.measurement:

Speed 1/min: 1400  
Charge press hPa: 1200

Inj.-qty. cm3/  
 difference 1000S.: -18.0...-26.0 #  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1400  
 Charge press hPa: 1200  
 TD-travel  
 difference mm: -0.7...-0.9 #  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1750  
 Charge press hPa: 1200  
 TD travel mm: 5.30...5.90  
 mm: (4.90...6.30)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press hPa: 1200  
 TD travel mm: 2.90...3.10  
 mm: (2.30...3.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1250  
 Charge press hPa: 1200  
 TD travel mm: 1.60...2.20  
 mm: (1.20...2.60)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1900  
 Charge press. hPa: 1200  
 TD travel mm: 5.30...5.90  
 mm: (4.90...6.30)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
 Charge press. hPa: 1200  
 Supply-pump  
 pressure bar: 3.80...4.40  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1400  
 Charge press. hPa: 1200  
 Supply-pump  
 pressure bar: 6.60...7.20  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1900  
 Charge press. hPa: 1200

Supply-pump  
 pressure bar: 8.70...9.30  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm3/10s: (60.00...134.50)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.30...180.70  
 quantity cm3/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 45.50...46.50  
 1000S.: (42.00...50.00)

2nd speed 1/min: 2300  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 2100  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 33.00...37.00  
 1000S.: (30.50...39.50)

8th speed 1/min: 2000  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 43.00...51.00  
 1000S.: (41.00...53.00)

9th speed 1/min: 1900  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 48.50...53.50  
 1000S.: (47.50...54.50)

12th speed 1/min: 1750  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynntity cm3/: 50.50...51.50  
 1000S.: (47.50...54.50)

15th speed 1/min: 1000  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 45.00...50.00  
 1000S.: (43.50...51.50)  
 16th speed 1/min: 800  
 Charge press. hPa: -  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.50...31.50  
 1000H.: (25.50...32.50)  
 18th speed 1/min: 550  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.00...27.00  
 1000S.: (23.00...30.00)  
 20th speed 1/min: 800  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 45.50...54.50  
 1000S.: (44.50...55.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 300  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...12.00  
 1000S.: (6.00...14.00)  
 Dispersion cm<sup>3</sup>/: 6.0  
 1000S.: (6.5)  
 2nd speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1400  
 Charge press. hPa: 1200  
 Inj.-qty. cm<sup>3</sup>/ : -19.0...-21.0"  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1400

Charge press. hPa: 1200  
 Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 ' 2  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1400  
 Charge press. hPa: 1200  
 TD-travel : -0.70...-0.90'  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1400  
 Charge press. hPa: 1200  
 Supply pump-  
 pressure : -0.10...-0.30"  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...105.00  
 1000S.: (55.00...105.00)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 14.00...30.00  
 1000S.: (14.00...30.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...90.00  
 1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: K1
KF	mm: -
MS	mm: 1.2...1.6
Ya	mm: 37.9...39.9
Yb	mm: 44.9...50.1

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900R542  
Type number : G 460 414 105  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.47.2200 "DI"

Power KW: 83  
Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 1000

H16

Setting value mm: 2.40...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 1000  
Setting value bar: 6.40...7.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1750  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 60.50...61.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 23.00...24.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 38.00...46.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...90.00  
mind 1000S.: 40.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:



Speed 1/min: 1400  
 Charge press hPa: -  
 Inj.-qty. cm3/  
 difference 1000S.: -15.0...-23.0 #  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1400  
 Charge press hPa: -  
 TD-travel  
 difference mm: -0.8...-1.0 #  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1600  
 Charge press hPa: 1000  
 TD travel mm: 3.50...4.10  
 mm: (3.10...4.50)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press hPa: 1000  
 TD travel mm: 2.40...2.60  
 mm: (1.80...3.20)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1250  
 Charge press hPa: 1000  
 TD travel mm: 1.20...1.80  
 mm: (0.80...2.20)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1900  
 Charge press. hPa: 1000  
 TD travel mm: 4.60...5.20  
 mm: (4.20...5.60)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.20...4.80  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1400  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.40...7.00  
 Shutoff  
 electromagnet Volt: 12

3rd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 8.10...8.70  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm3/10s: (60.00...134.50)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.30...180.70  
 quantity cm3/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 48.50...49.50  
 1000S.: (45.00...53.00)

2nd speed 1/min: 2325  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 2175  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 25.00...31.00  
 1000S.: (23.50...32.50)

5th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 12  
 Del. quantity cm3/: 38.00...46.00  
 1000S.: (36.00...48.00)

9th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 58.50...63.50  
 1000S.: (57.50...64.50)

12th speed 1/min: 1750  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 60.50...61.50  
 1000S.: (57.50...64.50)  
 15th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.50...60.50  
 1000S.: (54.00...62.00)  
 16th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm<sup>3</sup>/: 54.00...63.00  
 1000H.: (53.00...64.00)  
 18th speed 1/min: 550  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 23.00...24.00  
 1000S.: (20.00...27.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 325  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 325  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
 1000S.: (8.00...16.00)  
 Dispersion cm<sup>3</sup>/: 6.0  
 1000S.: (6.5)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1400  
 Charge press. hPa: -  
 Inj.-qty. cm<sup>3</sup>/: -15.5...17.5 "  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1400  
 Charge press. hPa: -  
 Inj.-qty. cm<sup>3</sup>/: +2.0...+8.0' Z  
 difference 1000S.: -

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1400  
 Charge press. hPa: -  
 TD-travel : -1.0...-1.8 "  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1400  
 Charge press. hPa: -  
 Supply pump-  
 pressure : -0.1...0.3 "  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...105.00  
 1000S.: (55.00...105.00)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 14.00...30.00  
 1000S.: (14.00...30.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...90.00  
 1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: K1
KF	mm: KOT
MS	mm: 1.4...1.6
Ya	mm: 33.0...35.0
Yb	mm: 46.4...52.4

Remarks:

:  
 :  
 Operate control lever after each  
 manifold-pressure compensator pressure

change.

Y<sub>a</sub> = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Y<sub>b</sub> = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEI  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2050L540  
Type number : 0 460 414 106  
Customer Part-No. :

Customer-specific information  
Customer : PENTA

Engine : TAMD 31 P 5424

Power KW: 117  
Speed 1/min: 2050

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000

H2O

Setting value mm: 2.50...2.90

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1000  
Setting value bar: 6.90...7.50

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 64.00...65.00  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 650  
Del. quantity cm3/  
1000S.: 35.00...36.00

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 11.00...15.00  
Del. quantity cm3/: 6.0  
1000S.: (6.0)

Full-load speed regulation

Speed 1/min: 2150  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 45.00...49.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 20.00...70.00  
mind 1000S.: 20.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1700  
Charge press hPa: 1000  
TD travel mm: 3.90...4.70  
mm: (3.40...5.20)

3rd speed 1/min: 1500  
Charge press hPa: 1000  
TD travel mm: 2.50...2.90  
mm: (2.00...3.40)

4th speed 1/min: 1300  
Charge press hPa: 1000

TD travel mm: 0.70...1.50  
mm: (0.20...2.00)

Supply-pump pressure characteristic:

1st speed 1/min: 2050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 8.70...9.30  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.90...7.50  
3rd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.20...4.80

Overflow quantity at overflow valve:

1st speed 1/min: 650  
Charge press. hPa: -  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)  
2nd speed 1/min: 2050  
Charge press. hPa: 1000  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900  
Charge-air pressure-setting point hPa: 400  
Del. quantity cm3/: 57.50...58.50  
1000S.: (55.00...61.00)  
2nd speed 1/min: 2300  
Charge press. hPa: 1000  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 2200  
Charge press. hPa: 1000  
Del. quantity cm3/: 15.00...39.00  
1000S.: -  
5th speed 1/min: 2150  
Charge press. hPa: 1000  
Del. quantity cm3/: 45.00...49.00  
1000S.: (41.00...53.00)  
9th speed 1/min: 2050  
Charge press. hPa: 1000  
Del. quantity cm3/: 55.00...60.00  
1000S.: (54.50...60.50)  
10th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm3/: 66.50...71.50  
1000S.: (64.00...74.00)  
12th speed 1/min: 1500  
Charge press. hPa: 1000

Del. quantity cm3/: 64.00...65.00  
1000S.: (62.00...67.00)  
16th speed 1/min: 650  
Charge press. hPa: -  
Del. quantity cm3/: 35.00...36.00  
1000H.: (33.00...38.00)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 2050  
Charge press. hPa: 1000  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Electr. shutoff:

1st speed 1/min: 300  
Charge press. hPa: -  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm3/: 11.00...15.00  
1000S.: (8.00...18.00)

Dispersion cm3/: 6.0  
1000S.: (6.0)  
2nd speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 250  
Del. quantity cm3/: 20.00...40.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm3/: 60.00...100.00  
1000S.: (60.00...100.00)

2nd speed 1/min: 500  
Del. quantity cm3/: 20.00...50.00  
1000S.: (20.00...50.00)

4th speed 1/min: 100  
Del. quantity cm3/: 20.00...70.00  
1000S.: (20.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: KOT
MS	mm: 1.1...1.5
Ya	mm: 37.2...39.2
Yb	mm: 48.5...56.5

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R359  
Type number : 0 460 424 054  
Customer Part-No. : 3 919 403

Customer-specific information  
Customer : CDC

Engine : 4 BTA AUTO

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.25  
mm: +0.02(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100

H23

Charge press. hPa: 1000  
Setting value mm: 2.00...2.40  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 5.30...5.90  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 83.00...84.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 53.00...54.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...12.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1330  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 68.00...74.00  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
mind 1000s.: 80.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.80...3.60  
mm: (2.50...3.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 2.00...2.40  
mm: (1.50...2.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 0.90...1.70  
mm: (0.60...2.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 400\*  
Charge press. hPa: -  
TD travel mm: 2.90...3.90  
mm: -

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2.60...3.20  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.90...5.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.30...5.90  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.00...6.60  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 535  
LDA-stroke mm: 6.4  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 71.50...72.50  
1000s.: (68.00...76.00)  
2nd speed 1/min: 1500



Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1430  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 15.00...45.00  
 1000S.: (15.00...45.00)  
 5th speed 1/min: 1330  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 68.00...74.00  
 1000S.: (65.00...77.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 76.50...79.50  
 1000S.: (75.00...81.00)  
 10th speed 1/min: 1100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 77.50...80.50  
 1000S.: (75.50...82.50)  
 12th speed 1/min: 850  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 83.00...84.00  
 1000S.: (80.50...86.50)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 53.00...54.00  
 1000S.: (49.50...57.50)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 94.00...103.0  
 1000S.: -

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: 12

Electr. shutoff:

1st speed 1/min: 375  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12

Idle delivery:

1st speed 1/min: 375  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...12.00  
 1000S.: (6.00...16.00)

Dispersion cm3/: 5.5  
 1000S.: (7.0)

2nd speed 1/min: 450  
 KSB/AFB  
 valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...2.00  
 1000S.: (0.00...2.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 80.00...140.00  
 1000S.: (80.00...140.00)

2nd speed 1/min: 250  
 KSB/AFB  
 valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
1000S.: (80.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS1 mm: 1.2...1.5  
SVS max. mm: 2.3  
LDA stroke mm: 6.4  
Ya mm: 34.8...38.8  
Yb mm: 40.3...45.7

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1250R359-1  
Type number : 0 460 424 055  
Customer Part-No. : 3 919 401

Customer-specific information  
Customer : CDC

Engine : 4 BTA AUTO

Power KW: 77  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.00  
mm: ±0.02(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.90...2.30  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 5.40...6.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 73.00...74.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 43.50...44.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

11

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 7.50...11.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1340  
Charge press hPa: 1000

Del. quantity cm<sup>3</sup>/1000s.: 54.00...60.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/1000s.: 80.00...140.00  
mind 1000s.: 80.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 0.60...1.55  
mm: (0.40...1.80)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 400\*  
Charge press. hPa: -  
TD travel mm: 2.70...3.70  
mm: -

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 2.70...3.30  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.40...5.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 5.40...6.00  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.00...6.60

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 600  
LDA-stroke mm: 6.4  
KSB/AFB  
valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.50...71.50  
                           1000S.: (67.00...75.00)  
 2nd speed 1/min: 1500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)  
 3rd speed 1/min: 1460  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...45.00  
                           1000S.: (15.00...45.00)  
 5th speed 1/min: 1340  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 54.00...60.00  
                           1000S.: (51.00...63.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 69.50...70.50  
                           1000S.: (67.00...73.00)  
 12th speed 1/min: 850  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 73.00...74.00  
                           1000S.: (70.50...76.50)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.50...44.50  
                           1000S.: (40.00...48.00)  
  
 Mech. shutoff:  
 Mech. Abst llung:  
  
 1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: 12  
  
 Electr. shutoff:  
  
 1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12  
  
 Idle delivery:  
  
 1st speed 1/min: 350  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 7.50...11.50  
                           1000S.: (4.50...14.50)  
 Dispersion cm<sup>3</sup>/: 5.5  
                           1000S.: (7.0)  
 2nd speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
                           1000S.: (0.00...6.00)  
  
 Automatic starting fuel delivery:  
  
 1st speed 1/min: 150  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 80.00...  
                           1000S.: -  
  
 2nd speed 1/min: 280  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: ... 80.00  
                           1000S.: -  
  
 4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 90.00...  
                           1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.6...3.8

KF mm: KOT

MS1 mm: 1.6...1.9

SVS max. mm: 2.4

LDA stroke mm: 6.4

Ya mm: 34.8...38.8

Yb mm: 40.9...45.3

Operate control lever after each manifold-pressure compensator pressure change.

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN  
Edition : 03.94  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1300R558  
Type number : 0 460 424 100  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : Phaser 135 TI "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 900  
Charge press. hPa: 1500  
Setting value mm: 1.60...1.80  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 900  
Charge press hPa: 1500

J03

Setting value bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1500  
Del. quantity cm3/  
1000S.: 90.50...91.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 60.50...61.50

Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 8.00...12.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1450  
Charge press hPa: 1500  
Del. quantity cm3/  
1000S.: 65.00...69.00

Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 100.00...160.00  
mind 1000S.: 100.0  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1000  
Charge press hPa: 1500  
TD travel mm: 2.50...3.10  
mm: (2.10...3.50)

Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 900  
 Charge press hPa: 1500  
 TD travel mm: 1.60...1.80  
                     mm: (1.20...2.20)  
  
 Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 800  
 Charge press hPa: 1500  
 TD travel mm: 0.40...1.00  
                     mm: (0.10...1.30)  
  
 Shutoff  
 electromagnet Volt: 24  
 5th speed 1/min: 1300  
 Charge press. hPa: 1500  
 TD travel mm: 3.00...3.60  
                     mm: (2.60...4.00)  
  
 Shutoff  
 electromagnet Volt: 24  
  
 Supply-pump pressure characteristic:  
  
 1st speed 1/min: 1300  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 8.00...8.60  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 900  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 6.30...6.90  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 500  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 4.50...5.10  
 Shutoff  
 electromagnet Volt: 24  
  
 Overflow quantity at overflow valve:  
  
 1st speed 1/min: 700  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...86.10  
 quantity cm<sup>3</sup>/10s: (26.70...101.10)  
 2nd speed 1/min: 1300  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)  
  
 Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 650  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 79.00...80.00  
                             1000S.: (76.50...82.50)  
 2nd speed 1/min: 1600  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                             1000S.: (0.00...3.00)  
 3rd speed 1/min: 1500  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 27.00...43.00  
                             1000S.: (25.00...45.00)  
 5th speed 1/min: 1450  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 65.00...69.00  
                             1000S.: (61.00...73.00)  
 9th speed 1/min: 1300  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 100.00...104.00  
                             1000S.: (98.50...105.50)  
 12th speed 1/min: 1000  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quynity cm<sup>3</sup>/: 90.50...91.50  
                             1000S.: (88.00...94.00)  
 16th speed 1/min: 700  
 Charge press. hPa: -  
 Shutoff  
 electromagnet volt: 24  
 Del. quantity cm<sup>3</sup>/: 57.00...62.00  
                             1000H.: (56.00...63.00)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 60.50...61.50  
                             1000S.: (58.00...64.00)  
 20th speed 1/min: 700  
 Charge press. hPa: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 88.00...92.00  
                             1000S.: (86.50...93.50)  
  
 Mech. shutoff:  
 Mech. Abstellung:  
  
 1st speed 1/min: 1300



Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 8.00...12.00  
1000S.: (5.00...15.00)  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 100.00...160.00  
1000S.: (100.00...160.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: (35.00...75.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 100.00...160.00  
1000S.: (100.00...160.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT

MS1 mm: 1.0...1.4  
Ya mm: 31.5...33.5  
Yb mm: 52.9...61.5

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 02.94  
replaces : 11.86  
Calibrating oil : ISO-4113

Injection pump : VE5/12F14COR232  
Type number : 0 460 426 077  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BT-5.9 AUTO

Power KW: 118  
Speed 1/min: 1400

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.1  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 900  
Charge press. hPa: 1000  
Setting value mm: 4.20...4.60  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 900  
Charge press hPa: 1000  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 67.00...68.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 30.50...31.50  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 360  
Del. quantity cm3/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1530  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 49.00...55.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 45.00...105.00  
mind 1000S.: 45.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 5.50...6.30  
mm: (5.20...6.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 4.20...4.60  
mm: (3.70...5.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2.40...3.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.10...4.70

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.10...6.70

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 500  
LDA-stroke mm: 6.7  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.50...59.50  
1000s.: (55.00...63.00)

2nd speed 1/min: 1700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

4th speed 1/min: 1620  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000s.: (15.00...55.00)

5th speed 1/min: 1530  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.00...55.00  
1000s.: (46.00...58.00)

9th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.50...64.50  
1000s.: (60.00...66.00)

10th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.50...67.50  
1000s.: (62.50...69.50)

12th speed 1/min: 900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 67.00...68.00  
1000s.: (64.50...70.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.50...31.50  
1000s.: (27.00...35.00)

20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 64.50...72.50  
1000S.: -

Mech. shutoff:  
Mech. Abst llung:

1st speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 360  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 360  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...115.00  
1000S.: (55.00...115.00)

2nd speed 1/min: 480  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...105.00  
1000S.: (45.00...105.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.1...1.5
SVS max.	mm: 1.5
LDA stroke	mm: 6.7
Ya	mm: 35.8...37.8
Yb	mm: 40.2...45.6

Remarks:

: C.D.C. # 390 8197

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : NIS  
Edition : 20.09.93  
replaces : 18.01.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F14J0R325  
Type number : 0 460 426 117  
Customer Part-No. :

Customer-specific information  
Customer : NISSAN

Engine : M 36 TC 125KW

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 2.10...2.50  
Shutoff  
electromagnet Volt: 24

J09

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 96.00...97.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 68.50...69.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 16.50...20.50

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1600  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 34.00...40.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 100.00...150.00  
mind 1000S.: 100.0  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 2.10...2.50  
mm: (1.60...3.00)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 3.70...4.50  
mm: (3.40...4.80)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.90...8.50  
Shutoff

electromagnet Volt: 24  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.60...7.20  
Shutoff

electromagnet Volt: 24  
3rd speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 75.00...119.50  
quantity cm<sup>3</sup>/10s: (60.00...134.50)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 350

LDA-stroke mm: 7.2  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 81.00...82.00  
1000S.: (78.50...84.50)

2nd speed 1/min: 1700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 34.00...40.00  
1000S.: (31.00...43.00)

9th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 83.50...86.50  
1000S.: (82.00...88.00)

10th speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 96.00...97.00  
1000S.: (93.50...99.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 68.50...69.50  
1000S.: (66.00...72.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 16.50...20.50  
1000S.: (13.50...23.50)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 450

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 0.00...3.00

Automatic starting fuel delivery:

1st speed 1/min: 200

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 120.00...160.00  
1000S.: (95.00...145.00)

2nd speed 1/min: 300

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 55.00...75.00  
1000S.: (55.00...75.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 100.00...150.00  
1000S.: (100.00...150.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm: 3.5...3.9

KF mm: K-OT

MS mm: 1.1...1.5

Ya mm: 37.2...39.2

Yb mm: 49.3...57.6

Remarks:

\* Correction at adjusting nut

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Overflow restriction 0.75 mm - Part No.  
..343,..344

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control

lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 02.94  
replaces : 08.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1000R369  
Type number : 0 460 426 138  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 6BT- 5.9 IND.

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 850  
Del. quantity cm3/  
1000S.: 66.50...67.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 6.00...12.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1040  
Del. quantity cm3/  
1000S.: 53.00...59.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
TD travel mm: 4.60...5.40  
mm: (4.30...5.70)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750



TD travel mm: 3.00...3.40  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 500  
TD travel mm: 0.90...1.70  
mm: (0.60...2.00)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.30...2.90  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Supply-pump  
pressure bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.20)  
2nd speed 1/min: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1120  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1060  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 25.00...55.00  
1000S.: (25.00...55.00)  
5th speed 1/min: 1040  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 53.00...59.00  
1000S.: (50.00...62.00)  
9th speed 1/min: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.50...66.50  
1000S.: (62.00...68.00)  
12th speed 1/min: 850

Shutoff  
electromagnet Volt: 24  
Del. quynity cm<sup>3</sup>/: 66.50...67.50  
1000S.: (64.00...70.00)  
15th speed 1/min: 750

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.00...66.00  
1000S.: (61.00...68.00)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 40.50...48.50  
1000S.: (38.50...50.50)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.0  
1000S.: -

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 6.00...12.00  
1000S.: (4.00...14.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)  
2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.00...35.00  
1000S.: (5.00...35.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation:

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 0.8...1.2
SVS max.	mm: 1.2
XK	mm: 18.8...20.8
XL	mm: 9.9...13.3
Ya	mm: 34.8...38.8
Yb	mm: 38.2...43.4

Remarks:  
: C.D.C. # 391 7563  
:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 02.94  
replaces : 10.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1150R225-23  
Type number : 0 460 426 143  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BT -5.9 IND

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 453 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC): +0.02(0.04)

Start of delivery block  
Piston stroke mm: 1.3  
mm: +0.02(0.06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 71.50...72.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1190  
Del. quantity cm3/  
1000S.: 50.00...56.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.50...6.30  
mm: (5.20...6.60)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750

TD travel mm: 3.40...3.80  
 mm: (2.90...4.30)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 TD travel mm: 1.50...2.30  
 mm: (1.20...2.60)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 2.40...3.00  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 750  
 Supply-pump pressure bar: 3.50...4.10  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 4.80...5.40  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...86.10  
 quantity cm<sup>3</sup>/10s: (26.70...101.20)  
 2nd speed 1/min: 1150  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1220  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
 1000S.: (15.00...55.00)  
 5th speed 1/min: 1190  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.00...56.00  
 1000S.: (47.00...59.00)  
 9th speed 1/min: 1150

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 66.50...69.50  
 1000S.: (65.00...71.00)  
 12th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 71.50...72.50  
 1000S.: (69.00...75.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 53.00...61.00  
 1000S.: (51.00...63.00)  
 Mech. shutoff:  
 Mech. Abstellung:  
 1st speed 1/min: 1150  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12  
 Electr. shutoff:  
 1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed 1/min: 375  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...14.00  
 1000S.: (6.00...16.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 130  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...130.00  
 1000S.: (70.00...130.00)  
 2nd speed 1/min: 240  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 20.00...60.00  
 1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 0.8...1.2
SVS max.	mm: 1.3
XK	mm: 20.2...22.2
XL	mm: 11.5...14.9
Ya	mm: 35.8...37.8
Yb	mm: 41.7...47.1

Remarks:

: C.D.C. # 391 8282  
: C.D.C. # 391 6949

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 14.02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1300R386  
Type number : 0 460 426 162  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : 6.60 PHASER 125

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.5  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1,0  
mm:  $\pm 0.02(0.06)$

Outlet : C

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Setting value mm: 1.80...2.20  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 5.20...5.80  
Shutoff  
electromagnet Volt: 24

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 76.50...77.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 3,5  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 19.50...23.50

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/  
1000S.: 44.50...50.50

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 75.00...105.00  
mind 1000S.: 75.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1300  
TD travel mm: 2.80...3.60  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1100

TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 950  
TD travel mm: 0.40...1.00  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.70...3.30  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 5.20...5.80  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1300  
Supply-pump  
pressure bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1300  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1530  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1480  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 14.00...22.00  
1000S.: (11.00...25.00)  
5th speed 1/min: 1400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 44.50...50.50  
1000S.: (41.50...53.50)  
9th speed 1/min: 1300

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 69.20...72.80  
1000S.: (67.50...74.50)

11th speed 1/min: 700  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 71.00...75.00  
1000S.: (69.50...76.50)  
12th speed 1/min: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 76.50...77.50  
1000S.: (74.00...80.00)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.50...67.50  
1000S.: (62.00...69.00)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 19.50...23.50  
1000S.: (16.50...26.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 4.50...10.50  
1000S.: (2.50...12.50)

#### Automatic starting fuel delivery:

1st speed 1/min: 180

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 90.00...120.00  
1000S.: (90.00...120.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 30.00...60.00  
1000S.: (30.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 75.00...105.00  
1000S.: (75.00...105.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: -
MS	mm: 1.2...1.6
SVS max.	mm: 2.8
Ya	mm: 37.2...39.2
Yb	mm: 45.2...53.7

Remarks:

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1200R265-3  
Type number : 0 460 426 190  
Customer Part-No. :

Customer-specific information  
Customer : SNF

Engine : WD612.61

Power kW: 100  
Speed 1/min: 2400

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Setting value mm: 1.40...1.80

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 5.50...6.10

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 87.00...88.00

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 16.00...20.00  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1275  
Del. quantity cm3/  
1000S.: 27.00...33.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...130.00  
mind 1000S.: 80.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 800  
TD travel mm: 1.40...1.80  
mm: (0.90...2.30)  
4th speed 1/min: 600  
TD travel mm: 0.20...1.00  
mm: (0.00...1.30)  
5th speed 1/min: 1200  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
Supply-pump  
pressure bar: 7.20...7.80  
2nd speed 1/min: 800  
Supply-pump  
pressure bar: 5.50...6.10  
3rd speed 1/min: 600  
Supply-pump  
pressure bar: 4.50...5.10

Overflow quantity at overflow valve:

1st speed 1/min: 550

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1200  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery quant. and breakaway char.:

2nd speed 1/min: 1380  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)  
5th speed 1/min: 1275  
Del. quantity cm<sup>3</sup>/: 27.00...33.00  
1000s.: (24.00...36.00)  
8th speed 1/min: 1230  
Del. quantity cm<sup>3</sup>/: 55.00...95.00  
1000s.: (55.00...95.00)  
9th speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: 85.00...88.00  
1000s.: (84.00...89.00)  
12th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: 87.00...88.00  
1000s.: (85.00...90.00)  
20th speed 1/min: 550  
Del. quantity cm<sup>3</sup>/: 74.00...77.00  
1000s.: (72.00...79.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 16.00...20.00  
1000s.: (14.00...22.00)  
Dispersion cm<sup>3</sup>/: 3.5  
1000s.: (3.5)  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 4.00...10.00  
1000s.: (3.00...11.00)  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del. quantity cm<sup>3</sup>/: 85.00...135.00  
1000s.: (85.00...135.00)

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 55.00...75.00  
1000s.: (55.00...75.00)

4th speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 80.00...130.00  
1000s.: (80.00...130.00)

Shutoff electromagnet:

Cut-in  
min voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS1 mm: 1.6...1.9  
SVS max. mm: 5.7  
Ya mm: 37.2...38.2  
Yb mm: 52.8...61.2

Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS  
Edition : 02.94  
replaces : 09.12.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1000R369-2  
Type number : U 460 426 196  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 6T 590

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 24

Full-load del. w/out charge press.:

Speed 1/min: 850  
Del. quantity cm<sup>3</sup>/  
1000S.: 66.50...67.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 6.00...12.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1040  
Del. quantity cm<sup>3</sup>/  
1000S.: 53.00...59.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
TD travel mm: 4.60...5.40  
mm: (4.30...5.70)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750

TD travel mm: 3.00...3.40  
 mm: (2.50...3.90)  
 Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 500  
 TD travel mm: 0.90...1.70  
 mm: (0.60...2.00)  
 Shutoff  
 electromagnet Volt: 24  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 2.30...2.90  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 750  
 Supply-pump  
 pressure bar: 3.30...3.90  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Supply-pump  
 pressure bar: 4.50...5.10  
 Shutoff  
 electromagnet Volt: 24  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...86.20  
 quantity cm<sup>3</sup>/10s: (26.70...101.20)  
 2nd speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1120  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1060  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 25.00...55.00  
 1000S.: (25.00...55.00)  
 5th speed 1/min: 1040  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 53.00...59.00  
 1000S.: (50.00...62.00)  
 9th speed 1/min: 1000

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 63.50...66.50  
 1000S.: (62.00...68.00)  
 12th speed 1/min: 850  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 66.50...67.50  
 1000S.: (64.00...70.00)  
 15th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 63.00...66.00  
 1000S.: (61.00...68.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 40.50...48.50  
 1000S.: (38.50...50.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 6.00...12.00  
 1000S.: (4.00...14.00)

Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 70.00...130.00  
 1000S.: (70.00...130.00)

2nd speed 1/min: 240  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 5.00...35.00  
 1000S.: (5.00...35.00)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 0.3...1.2
SVS max.	mm: 1.2
XK	mm: 18.8...20.8
XL	mm: 6.8...10.2
Ya	mm: 34.8...38.8
Yb	mm: 38.2...43.4

Remarks:

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : NIS  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F120GR325-2  
Type number : 0 460 426 206  
Customer Part-No. :

Customer-specific information  
Customer : NISSAN-MISA

Engine : HX 150 "DI"

Power KW: 119.5  
Speed 1/min: 1200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000

Setting value mm: 1.60...2.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 7.20...7.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 92.00...93.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 82.50...83.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 44.00...50.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 100.00...150.00  
mind 1000S.: 100.0  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 2.30...3.10  
 mm: (2.00...3.40)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 1.60...2.00  
 mm: (1.10...2.50)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 0.50...1.30  
 mm: (0.20...1.60)

Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.80...8.40

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.20...7.80

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.30...4.90

Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm<sup>3</sup>/10s: (60.00...134.50)

2nd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.30...180.70  
 quantity cm<sup>3</sup>/10s: (82.30...195.70)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
 Charge-air pressure-setting point hPa: 500  
 LDA-stroke mm: 5.2  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 85.00...86.00  
 1000S.: (81.50...89.50)

2nd speed 1/min: 1400  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 1330  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...10.00  
 1000S.: -

5th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 44.00...50.00  
 1000S.: -

8th speed 1/min: 1280  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 63.00...83.00  
 1000S.: -

9th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 85.00...88.00  
 1000S.: (83.00...90.00)

12th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm<sup>3</sup>/: 92.00...93.00  
 1000S.: (89.50...95.50)

18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 82.50...83.50  
 1000S.: (80.00...86.00)

20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 100.00...106.00  
 1000S.: -

# Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated  
temperatura

Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 77.00...83.00  
1000S.: (80.00...80.00)

Mech. shutoff:

Mech. Abstellung:

1st speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff

electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 480

Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 120.00...170.00  
1000S.: -

2nd speed 1/min: 300

Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...90.00  
1000S.: -

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 105.00...155.00  
1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.7...3.9

KF mm: KOT

MS mm: 1,4...1.6

SVS max. mm: 4.4

LDA stroke mm: 5.2

Ya mm: 37.9...39.9

Yb mm: 52.2...60.6

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Values without check tolerance do  
not apply when checking pump.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : NIS  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1200R325-3  
Type number : 0 460 425 207  
Customer Part-No. :

Customer-specific information  
Customer : NISSAN-MISA

Engine : HX 130 "DI"

Power KW: 103  
Speed 1/min: 2400

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Charge press. hPa: 1000

K01

Setting value mm: 1.80...2.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 77.50...78.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 73.00...74.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 48.00...54.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 100.00...150.00  
mind 1000S.: 100.0

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 3.70...4.50  
 mm: (3.20...5.00)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 900  
 Charge press hPa: 1000  
 TD travel mm: 1.80...2.20  
 mm: (1.30...2.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 700  
 Charge press hPa: 1000  
 TD travel mm: 0.40...1.20  
 mm: (0.10...1.50)

Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.70...8.30

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 900  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.30...6.90

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.40...5.00

Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm<sup>3</sup>/10s: (60.00...134.50)

2nd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.30...180.70  
 quantity cm<sup>3</sup>/10s: (82.30...195.70)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
 Charge-air pressure-setting point hPa: 375  
 LDA-stroke mm: 5.2  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 74.00...75.00  
 1000S.: (70.50...78.50)

2nd speed 1/min: 1400  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 1330  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...10.00  
 1000S.: (0.00...10.00)

5th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 48.00...54.00  
 1000S.: -

8th speed 1/min: 1280  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...75.00  
 1000S.: -

9th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 67.50...70.50  
 1000S.: (65.50...72.50)

12th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 77.50...78.50  
 1000S.: (75.00...81.00)

18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 73.00...74.00  
 1000S.: (70.50...76.50)

20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 77.00...83.00  
 1000S.: -

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1200  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12  
  
 Electr. shutoff:  
  
 1st speed 1/min: 400  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
  
 Idle delivery:  
  
 1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.00...17.00  
                   1000S.: (10.00...20.00)  
 Dispersion cm<sup>3</sup>/: 5.0  
                   1000S.: (5.0)  
 2nd speed 1/min: 480  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)  
  
 Automatic starting fuel delivery:  
  
 1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 115.00...165.00  
                   1000S.: (115.00...165.00)  
  
 2nd speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...85.00  
                   1000S.: (55.00...85.00)  
  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 100.00...150.00  
                   1000S.: (100.00...150.00)  
  
 Shutoff electromagnet:  
  
 Cut-in  
   min voltage : 10.0  
 Rated voltage : 12.0  
  
 Mounting and assembly dimensions:

Designation	
K	mm: 3.7...3.9
KF	mm: KOT
MS	mm: 1.3...1.7
LDA stroke	mm: 5.2
Ya	mm: 37.9...39.9
Yb	mm: 52.1...60.5

Remarks:

:  
 :  
 Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

Permissible port/port scatter with  
 stop test, electrical = max. 5.0  
 ccm/1000 S.

Permissible port/port scatter with  
 stop test, mechanical = max. 5.0  
 ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : NIS  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1200R491  
Type number : 0 460 426 208  
Customer Part-No. :

Customer-specific information  
Customer : NISSAN-MISA

Engine : HX 110 "DI"

Power KW: 87  
Speed 1/min: 1200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.10...2.50

K04

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 800  
Del. quantity cm3/  
1000S.: 63.50...64.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1270  
Del. quantity cm3/  
1000S.: 29.00...35.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...140.00  
mind 1000S.: 90.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
TD travel mm: 3.70...4.50  
mm: (3.40...4.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900  
TD travel mm: 2.10...2.50  
mm: (1.60...3.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 700  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 75.00...119.50  
quantity cm<sup>3</sup>/10s: (60.00...134.50)  
2nd speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 1270  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.00...35.00  
1000S.: (25.00...39.00)  
9th speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.50...60.50  
1000S.: (56.00...62.00)  
12th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (61.00...67.00)  
20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.50...64.50  
1000S.: (60.00...66.00)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 105.00...155.00  
1000S.: -

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...140.00  
1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.7...3.9

KF mm: KOT

MS mm: 1.3...1.7

SVS max. mm: 5.5

LDA stroke mm: 5.2

Ya mm: 37.9...39.9

Yb mm: 48.8...57.2

Remarks:

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN  
Edition : 02.94  
replaces : 15.02.93  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1200R496  
Type number : 0 460 426 209  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : D 0826 LF 07 "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): ±0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 2.00...2.40

Supply-pump pressure

K07

Speed 1/min: 850  
Charge press hPa: 1000  
Setting value bar: 7.30...7.90

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 91.50...92.50  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 59.50...60.50

Low-idle speed regulation

Speed 1/min: 250  
Del. quantity cm3/  
1000S.: 16.50...23.50  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 1280  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 62.00...68.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...100.00  
mind 1000S.: 60.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 950  
Charge press hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 2.00...2.40  
mm: (1.50...2.90)

4th speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.50...6.10  
 2nd speed 1/min: 850  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.30...7.90  
 3rd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 9.00...9.60

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Overflow : 41.70...86.10  
 quantity cm<sup>3</sup>/10s: (26.70...101.10)  
 2nd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 500  
 Charge-air pressure-setting  
 point hPa: 450  
 LDA-stroke mm: 7.5  
 Del. quantity cm<sup>3</sup>/: 92.50...93.50  
 1000S.: (90.50...95.50)  
 2nd speed 1/min: 1450  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...15.00  
 1000S.: (0.00...15.00)  
 4th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 30.00...66.00  
 1000S.: (30.00...66.00)  
 5th speed 1/min: 1280  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 62.00...68.00  
 1000S.: (60.50...69.50)  
 9th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 86.90...91.90  
 1000S.: (85.40...93.40)  
 12th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Del. quynity cm<sup>3</sup>/: 91.50...92.50  
 1000S.: (89.50...94.50)  
 15th speed 1/min: 800  
 Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/: 92.10...97.10  
 1000S.: (90.60...98.60)  
 17th speed 1/min: 600  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 98.50...103.50  
 1000H.: (97.00...105.00)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 59.50...60.50  
 1000S.: (57.50...62.50)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 102.10...111.10  
 1000S.: (100.60...112.60)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1200  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 250  
 Del. quantity cm<sup>3</sup>/: 16.50...23.50  
 1000S.: (14.50...25.50)  
 Dispersion cm<sup>3</sup>/: 6.0  
 1000S.: (6.5)  
 2nd speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 330  
 Del. quantity cm<sup>3</sup>/: 70.00...100.00  
 1000S.: (70.00...100.00)  
 2nd speed 1/min: 430  
 Del. quantity cm<sup>3</sup>/: 40.00...70.00  
 1000S.: (40.00...70.00)  
 4th speed 1/min: 100  
 Del. quantity cm<sup>3</sup>/: 60.00...100.00  
 1000S.: (60.00...100.00)

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: KOT
MS	mm: 0.9...1.3
SVS max.	mm: 1.1
LDA stroke	mm: 7.5
Ya	mm: 37.4...40.4
Yb	mm: 44.2...49.4

Remarks:



⋮  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Pump with slave plunger

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R498  
Type number : 0 460 426 211  
Customer Part-No. : 3 282 306

Customer-specific information  
Customer : CDC

Engine : 6 BT- 5.9A

Power KW: 132  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.4  
mm: ±0.02(0.06)

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.50...1.90  
Shutoff  
electromagnet volt: 24

## Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 81.50...82.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: -

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 65.50...66.50  
Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 6.00...10.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1380  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 63.50...69.50  
Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 75.00...105.00  
mind 1000S.: 75.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 1250  
Charge press. hPa: 1000  
TD travel mm: 2.30...3.10  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 1.50...1.90  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 24  
7. Rotacao 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 24  
8th speed 1/min: 450  
Charge press. hPa: -  
TD travel mm: 2.00...3.00  
mm: (1.80...3.20)

KSB/AFB  
valve Volt: 24  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.90...4.50

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.90...6.50

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.30...6.90

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.30...7.90

Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...93.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1100  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting  
point hPa: 450  
LDA-stroke mm: 6.5  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 72.50...73.50  
1000S.: (69.00...77.00)

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

3rd speed 1/min: 1465  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...35.00  
1000S.: -

4th speed 1/min: 1380  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.50...69.50  
1000S.: (60.50...72.50)

5th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 80.00...83.00  
1000S.: (78.50...84.50)

6th speed 1/min: 1200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 81.50...84.50  
1000S.: (79.50...86.50)

7th speed 1/min: 850

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 81.50...82.50  
1000S.: (79.00...85.00)  
8th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.50...66.50  
1000S.: (62.00...70.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (3.00...13.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 410  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 240  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...90.00  
1000S.: (60.00...90.00)

2nd speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 80.00...120.00  
1000S.: (80.00...120.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 75.00...105.00  
1000S.: (75.00...105.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS1 mm: 1.2...1.5  
SVS max. mm: 3.7  
LDA stroke mm: 6.5  
Ya mm: 34.8...38.8  
Yb mm: 48.2...53.8

Remarks:

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1350R506  
Type number : 0 460 426 215  
Customer Part-No. :

Customer-specific information  
Customer : IVECO FIAT

Engine : 8060.45.4400 "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 3.10...3.30  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 7.90...8.50  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 74.50...75.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 48.50...49.50  
Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 4.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1525  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 27.00...33.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.0  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1350  
Charge press hPa: 1000  
TD travel mm: 4.60...5.20  
mm: (4.20...5.60)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.70...2.30  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 3.10...3.30  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 1350  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 9.30...9.90

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.90...8.50

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.00...5.60

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 90.20...131.90  
quantity cm<sup>3</sup>/10s: (75.20...156.90)

2nd speed 1/min: 1350  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

#### Delivery-quant. and breakaway char.:

1nd speed 1/min: 500  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 6.1

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 62.50...63.50  
1000S.: (59.00...67.00)

2nd speed 1/min: 1625  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

4th speed 1/min: 1475  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 45.00...53.00  
1000S.: (43.00...55.00)

5th speed 1/min: 1525  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 27.00...33.00  
1000S.: (24.00...36.00)

9th speed 1/min: 1350  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 67.50...70.50  
1000S.: (65.50...72.50)

12th speed 1/min: 1200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...74.00  
1000S.: (68.50...75.50)

13th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 74.50...75.50  
1000S.: (71.50...78.50)

14th speed 1/min: 600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 77.50...81.50  
1000S.: (76.00...83.00)

15th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 48.50...49.50  
1000S.: (45.50...52.50)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (5.0)

2nd speed 1/min: 425  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 4.00...10.0  
1000S.: (2.00...12.0)

#### Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 40.00...60.00  
1000S.: -

2nd speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: -

#### Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

#### Mounting and assembly dimensions:

Designation  
K mm: 3.5...3.7  
KF mm: KOT

K15

MS1 mm: 1.1...1.4  
LDA stroke mm: 6.1  
Ya mm: 37.9...39.9  
Yb mm: 41.2...46.6

#### Remarks:

:  
:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEN  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1950L527  
Type number : 0 460 426 218  
Customer Part-No. :

Customer-specific information  
Customer : PENTA

Engine : KAD / KAMD 42 CE

Power KW: 155  
Speed 1/min: 1950

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1500

Setting value mm: 3.30...3.70

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1500  
Setting value bar: 7.70...8.30

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1500  
Del. quantity cm3/  
1000S.: 81.50...82.50  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 54.00...55.00

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm3/  
1000S.: 21.00...25.00  
Del. quantity cm3/: 14.0  
1000S.: (14)

Full-load speed regulation

Speed 1/min: 2050  
Charge press hPa: 1500  
Del. quantity cm3/  
1000S.: 57.00...63.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 20.00...70.00  
mind 1000S.: 20.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800  
Charge press hPa: 1500  
TD travel mm: 4.10...5.10  
mm: (3.70...5.50)

3rd speed 1/min: 1500  
Charge press hPa: 1500  
TD travel mm: 3.30...3.70  
mm: (2.80...4.20)

4th speed 1/min: 1100  
Charge press hPa: 1500



TD travel mm: 0.80...1.80  
mm: (0.40...2.20)  
5th speed 1/min: 1950  
Charge press. hPa: 1500  
TD travel mm: 4.50...5.50  
mm: (4.10...5.90)

Supply-pump pressure characteristic:

1st speed 1/min: 1950  
Charge press. hPa: 1500  
Supply-pump pressure bar: 9.20...9.80  
2nd speed 1/min: 1500  
Charge press. hPa: 1500  
Supply-pump pressure bar: 7.70...8.30  
4th speed 1/min: 800  
Charge press. hPa: 1500  
Supply-pump pressure bar: 5.20...5.80

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Charge press. hPa: 1500  
Overflow quantity cm<sup>3</sup>/10s: 69.50...152.90  
(54.50...167.90)  
2nd speed 1/min: 1950  
Charge press. hPa: 1500  
Overflow quantity cm<sup>3</sup>/10s: 97.30...180.70  
(102.30...195.70)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 750  
LDA-stroke mm: 7.1  
Del. quantity cm<sup>3</sup>/: 82.00...83.00  
1000S.: (78.50...86.50)  
2nd speed 1/min: 2300  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
4th speed 1/min: 2180  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...25.00  
1000S.: -  
5th speed 1/min: 2050  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 57.00...63.00  
1000S.: (52.00...68.00)  
9th speed 1/min: 1950  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 74.50...78.50  
1000S.: (73.00...80.00)  
12th speed 1/min: 1500  
Charge press. hPa: 1500

Del. quantity cm<sup>3</sup>/: 81.50...82.50  
1000S.: (79.00...85.00)  
15th speed 1/min: 1200  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 83.50...88.50  
1000S.: (82.50...89.50)  
18th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 54.00...55.00  
1000S.: (51.50...57.50)  
20th speed 1/min: 800  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 92.50...99.50  
1000S.: (91.00...101.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1950  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Electr. shutoff:

1st speed 1/min: 325  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Idle delivery:

1st speed 1/min: 325  
Del. quantity cm<sup>3</sup>/: 21.00...25.00  
1000S.: (18.00...28.00)  
Dispersion cm<sup>3</sup>/: 14  
1000S.: (14)  
2nd speed 1/min: 580  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 275  
Del. quantity cm<sup>3</sup>/: 50.00...100.00  
1000S.: (50.00...100.00)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 30.00...60.00  
1000S.: (30.00...60.00)  
4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 20.00...70.00  
1000S.: (20.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: -  
MS mm: 0.8...1.2  
SVS max. mm: 1.6  
LDA stroke mm: 7.1  
Ya mm: 37.2...39.2  
Yb mm: 49.1...56.9

#### Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

#### Pushing electromagnet.

Always pay attention to test  
instructions for DISTRIBUTOR-TYPE  
INJECTION PUMPS FOR DI ENGINES!

Information additionally  
required for testing fuel-injection  
pump:

#### TEST PREREQUISITES

Calibrating-oil return temperature with  
thermometer, °C :55

Calibrating-oil inlet  
temperature, °C :42...47

Dwell speed, 1/min :1200  
Feedback voltage, mV :-

#### SETTINGS/TEST SPECIFICATIONS FOR FUEL-INJECTION PUMP,

#### delivery rates

Test speed, 1/min :<500  
Temperature stabilisation  
speed 1/min :2000  
Output temperature, °C :65  
Measurement temperature, °C:61

Test speed, 1/min :500...799  
Temperature stabilisation  
speed 1/min :2000  
Output temperature, °C :61  
Measurement temperature, °C:57

Test speed, 1/min :800...1199  
Temperature stabilisation  
speed 1/min :2000  
Output temperature, °C :60  
Measurement temperature, °C:56

Test speed, 1/min :1200...1700  
Temperature stabilisation  
speed 1/min :100  
Output temperature, °C :53  
Measurement temperature, °C:55

Test speed, 1/min : 1700  
Temperature stabilisation  
speed 1/min :100  
Output temperature, °C :51  
Measurement temperature, °C:53

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEN  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1950L528  
Type number : 0 460 426 219  
Customer Part-No. :

Customer-specific information  
Customer : PENTA

Engine : KAD

Power KW: 169  
Speed 1/min: 1950

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1500

Setting value mm: 3.20...3.60

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1500  
Setting value bar: 8.30...8.90

Full-load del. with charge press.:

Speed 1/min: 1800  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/  
1000S.: 92.00...93.00  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 48.00...49.00

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...11.00  
Del. quantity cm<sup>3</sup>/: 5.00  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 2180  
Charge press hPa: 1500  
Del. quantity cm<sup>3</sup>/  
1000S.: 9.00...15.00

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
mind 1000S.: 65.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1900  
Charge press hPa: 1500  
TD travel mm: 4.40...5.40  
mm: (4.00...5.80)

3rd speed 1/min: 1500  
Charge press hPa: 1500  
TD travel mm: 3.20...3.60  
mm: (2.70...4.10)

4th speed 1/min: 1100  
Charge press hPa: 1500

TD travel           mm: 0.50...1.50  
                    mm: (0.10...1.90)

Supply-pump pressure characteristic:

1st speed    1/min: 1900  
Charge press. hPa: 1500  
Supply-pump  
pressure     bar: 9.40...10.00  
2nd speed    1/min: 1500  
Charge press. hPa: 1500  
Supply-pump  
pressure     bar: 8.30...8.90  
3rd speed    1/min: 1100  
Charge press. hPa: 1500  
Supply-pump  
pressure     bar: 7.00...7.60  
4th speed    1/min: 600  
Charge press. hPa: 1500  
Supply-pump  
pressure     bar: 5.20...5.80

Overflow quantity at overflow valve:

1st speed    1/min: 800  
Charge press. hPa: 1500  
Overflow     : 88.80...133.30  
quantity    cm<sup>3</sup>/10s: (73.80...148.30)  
2nd speed    1/min: 1950  
Charge press. hPa: 1500  
Overflow     : 97.30...180.70  
quantity    cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1st speed    1/min: 800  
Charge-air pressure-setting  
point       hPa: 750  
LDA-stroke   mm: 7.5  
Del. quantity cm<sup>3</sup>/: 65.00...66.00  
                    1000S.: (61.50...69.50)  
2nd speed    1/min: 2300  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                    1000S.: (0.00...3.00)  
4th speed    1/min: 2180  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 9.00...15.00  
                    1000S.: (4.00...20.00)  
5th speed    1/min: 1950  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 88.50...92.50  
                    1000S.: (87.00...94.00)  
6th speed    1/min: 1800  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 92.00...93.00  
                    1000S.: (89.50...95.50)  
8th speed    1/min: 1500  
Charge press. hPa: 1500

Del. quantity cm<sup>3</sup>/: 91.00...96.00  
                    1000S.: (90.00...97.00)  
9th speed    1/min: 1250  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 86.50...91.50  
                    1000S.: (85.50...92.50)  
11th speed   1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 48.00...49.00  
                    1000S.: (45.50...51.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed    1/min: 1950  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                    1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Electr. shutoff:

1st speed    1/min: 325  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                    1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Idle delivery:

1st speed    1/min: 325  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
                    1000S.: (4.00...14.00)  
Dispersion   cm<sup>3</sup>/: 5.0  
                    1000S.: (5.0)  
2nd speed    1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                    1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed    1/min: 275  
Del. quantity cm<sup>3</sup>/: 50.00...100.00  
                    1000S.: (50.00...100.00)

2nd speed    1/min: 400  
Del. quantity cm<sup>3</sup>/: 25.00...55.00  
                    1000S.: (25.00...55.00)

4th speed    1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
                    1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage       : 10.0  
Rated voltage     : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: KOT
MS1	mm: 1.6...1.9
SVS max.	mm: 1.9
LDA stroke	mm: 751
Ya	mm: 37.2...39.2
Yb	mm: 53.6...61.4

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

Pushing electromagnet.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MWM  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1150R534  
Type number : 0 460 426 220  
Customer Part-No. :

Customer-specific information  
Customer : MWM

Engine : TD 226-86

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.10...2.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 6.80...7.40  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 68.00...69.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm3/  
1000S.: 10.00...16.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 37.00...43.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 79.00...82.00 v  
mind 1000S.: 72.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
TD travel mm: 2.70...3.50  
mm: (2.40...3.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900  
TD travel mm: 2.10...2.30  
mm: (1.70...2.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800

TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1150  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 6.80...7.40  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 40.30...84.70  
quantity cm<sup>3</sup>/10s: (25.30...98.70)  
2nd speed 1/min: 1150  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
2nd speed 1/min: 1300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 1260  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...40.00  
1000S.: -  
6th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (31.50...48.50)  
8th speed 1/min: 1150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.00...66.00  
1000S.: (61.50...67.50)  
9th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 66.00...68.00  
1000S.: (64.50...70.50)  
12th speed 1/min: 900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 68.00...69.00  
1000S.: (66.00...71.00)  
18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.50...61.50  
1000S.: (54.50...62.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...16.00  
1000S.: (6.50...19.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (6.5)

2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...100.00  
1000S.: -

2nd speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 100.00...180.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.00...81.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.5...3.7
KF	mm: KOT
MS	mm: 0.9...1.3
SVS max.	mm: 1.4
Ya	mm: 41.4...45.4
Yb	mm: 40.6...46.4

Remarks:

:  
Starting delivery check  
V = Speed-control lever in full-load  
position

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1350R555  
Type number : 0 460 426 227  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8060.45.4485 "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.90...2.30  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 7.00...7.60  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 75.50...76.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 47.00...48.00  
Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 14.00...18.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 4.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1475  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 44.00...50.00  
Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 3.80...4.60  
                     mm: (3.50...4.90)  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.90...2.30  
                     mm: (1.40...2.80)  
 Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 900  
 Charge press hPa: 1000  
 TD travel mm: 0.50...1.30  
                     mm: (0.20...1.60)  
 Shutoff  
 electromagnet Volt: 24  
  
 Supply-pump pressure characteristic:  
  
 1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.70...5.30  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.00...7.60  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 8.80...9.40  
 Shutoff  
 electromagnet Volt: 24  
  
 Overflow quantity at overflow valve:  
  
 1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 69.50...152.90  
 quantity cm<sup>3</sup>/10s: (54.50...167.90)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 97.30...180.70  
 quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 600

Charge-air pressure-setting point hPa: 450  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 66.00...67.00  
                                     1000S.: (62.50...70.50)  
 2nd speed 1/min: 1550  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                                     1000S.: (0.00...3.00)  
 5th speed 1/min: 1450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 59.00...71.00  
                                     1000S.: (57.00...73.00)  
 8th speed 1/min: 1475  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 44.00...50.00  
                                     1000S.: (41.00...53.00)  
 9th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 68.50...71.50  
                                     1000S.: (66.50...73.50)  
 10th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 69.50...73.50  
                                     1000S.: (68.00...75.00)  
 12th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 75.50...76.50  
                                     1000S.: (72.50...79.50)  
 13th speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 44.00...48.00  
                                     1000S.: (42.00...50.00)  
 14th speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 76.50...80.50  
                                     1000S.: (75.00...82.00)  
 15th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 47.00...48.00  
                                     1000S.: (44.00...51.00)

Mech. shutoff:  
Mech. Abst.ellung:

1st speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 14.00...18.00  
1000S.: (11.00...21.00)  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (5.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

K27

Mounting and assembly dimensions:

Designation

K	mm: 3.5...3.7
KF	mm: KOT
MS1	mm: 1.2...1.5
Ya	mm: 37.9...39.9
Yb	mm: 39.3...44.7

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R556  
Type number : 0 460 426 228  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : Q20 Phaser 210Ti

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1500  
Setting value mm: 1.50...1.70  
Shutoff  
electromagnet Volt: 24

K28

## Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1500  
Setting value bar: 7.20...7.80  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1500  
Del. quantity cm3/  
1000S.: 93.50...94.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 56.00...57.00

Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 280  
Del. quantity cm3/  
1000S.: 9.00...13.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 6.5  
1000S.: (6.5)

## Full-load speed regulation

Speed 1/min: 1400  
Charge press hPa: 1500  
Del. quantity cm3/  
1000S.: 42.00...48.00

Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 130.00...190.00  
mind 1000S.: 130.0

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1500  
TD travel mm: 2.10...2.70  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Charge press hPa: 1500  
TD travel mm: 1.50...1.70  
mm: (1.00...2.20)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 900  
Charge press hPa: 1500  
TD travel mm: 0.40...1.00  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 1250  
Charge press. hPa: 1500  
Supply-pump  
pressure bar: 8.20...8.80  
Shutoff

electromagnet Volt: 24  
2nd speed 1/min: 1000  
Charge press. hPa: 1500  
Supply-pump  
pressure bar: 7.20...7.80  
Shutoff

electromagnet Volt: 24  
3rd speed 1/min: 700  
Charge press. hPa: 1500  
Supply-pump  
pressure bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)  
2nd speed 1/min: 1250  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

1nd speed 1/min: 700

Charge-air pressure-setting  
point hPa: 700  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 81.00...82.00  
1000S.: (78.00...85.00)

2nd speed 1/min: 1480  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1400  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 42.00...48.00  
1000S.: (39.00...51.00)

8th speed 1/min: 1350  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...95.00  
1000S.: (65.00...95.00)

9th speed 1/min: 1250  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 100.00...105.00  
1000S.: (99.00...106.00)

12th speed 1/min: 900  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 93.50...94.50  
1000S.: (90.50...97.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 56.00...57.00  
1000S.: (53.00...60.00)

20th speed 1/min: 700  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 92.50...98.50  
1000S.: (91.50...99.50)

Mech. shutoff:  
Mech. Abst.ung:

1st speed 1/min: 1250  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 280  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 280  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 9.00...13.00  
1000S.: (5.00...17.00)

Dispersion cm<sup>3</sup>/: 6.5  
1000S.: (6.5)

2nd speed 1/min: 400

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 300

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 1.00...9.00  
1000S.: (0.00...10.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 130.00...190.00  
1000S.: (130.00...190.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 50.00...90.00  
1000S.: (50.00...90.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 130.00...190.00  
1000S.: (130.00...190.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS1 mm: 1.4...1.7

LO2

Ya mm: 37.2...39.2  
Yb mm: 44.9...53.5

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1350R559  
Type number : 0 460 426 229  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8060.45.4385 "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.60  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 61.00...62.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 56.00...57.00

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 4.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 41.00...47.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 2.40...3.00  
                     mm: (2.00...3.40)  
 Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.40...1.60  
                     mm: (0.80...2.20)  
 Shutoff  
 electromagnet Volt: 24  
 5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 TD travel mm: 4.60...5.20  
                     mm: (4.20...5.60)  
 Shutoff  
 electromagnet Volt: 24  
  
 Supply-pump pressure characteristic:  
  
 1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.80...4.40  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.60...7.20  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 8.50...9.10  
 Shutoff  
 electromagnet Volt: 24  
  
 Overflow quantity at overflow valve:  
  
 1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 69.50...152.90  
 quantity cm<sup>3</sup>/10s: (54.50...167.90)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 97.30...180.70  
 quantity cm<sup>3</sup>/10s: (82.30...195.70)  
  
 Delivery-quant. and breakaway char.:  
  
 1st speed 1/min: 500

Charge-air pressure-setting point hPa: 150  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 62.50...63.50  
                                     1000S.: (59.00...67.00)  
 2nd speed 1/min: 1630  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                                     1000S.: (0.00...3.00)  
 5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 41.00...47.00  
                                     1000S.: (36.00...52.00)  
 8th speed 1/min: 1450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 47.00...63.00  
                                     1000S.: (45.00...65.00)  
 9th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 57.00...60.00  
                                     1000S.: (55.00...62.00)  
 10th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 59.50...63.50  
                                     1000S.: (58.00...65.00)  
 12th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 63.50...67.50  
                                     1000S.: (62.00...69.00)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 56.00...57.00  
                                     1000S.: (53.00...59.00)  
  
 Mech. shutoff:  
 Mech. Abststellung:  
  
 1st speed 1/min: 1350  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 24  
  
 Electr. shutoff:



1st speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (5.0)

2nd speed 1/min: 425  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.5...3.7  
KF mm: KOT  
MS1 mm: 1.2...1.4  
Ya mm: 37.9...39.9  
Yb mm: 42.3...46.5

Remarks:

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1350R561  
Type number : 0 460 426 230  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8060.45.4385 "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 2.60...2.80  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 7.90...8.50  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 65.00...66.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 48.00...49.00

Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 4.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 37.00...43.00

Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

3rd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 2.60...2.80  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.20...1.80  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 1350  
Charge press. hPa: 1000  
TD travel mm: 4.60...5.20  
mm: (4.20...5.60)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.20...5.80  
Shutoff

electromagnet Volt: 24  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.90...8.50  
Shutoff

electromagnet Volt: 24  
3rd speed 1/min: 1350  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 9.40...10.00  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 69.50...152.90  
quantity cm<sup>3</sup>/10s: (54.50...167.90)  
2nd speed 1/min: 1350  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 600

Charge-air pressure-setting  
point hPa: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.50...61.50  
1000S.: (57.00...65.00)

2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (32.00...48.00)

8th speed 1/min: 1450  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 45.00...61.00  
1000S.: (43.00...63.00)

9th speed 1/min: 1350  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 57.00...60.00  
1000S.: (55.00...62.00)

10th speed 1/min: 1200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 59.50...63.50  
1000S.: (58.00...65.00)

12th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...66.00  
1000S.: (62.00...69.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 48.00...49.00  
1000S.: (45.00...52.00)

20th speed 1/min: 600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 66.50...70.50  
1000S.: (65.00...72.00)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1350  
Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)

Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (5.0)

2nd speed 1/min: 425

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: (0.00...10.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 25.00...55.00  
1000S.: (25.00...55.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: 3.5...3.7
KF	mm: KOT
MS1	mm: 1.5...1.8
Ya	mm: 37.9...39.9
Yb	mm: 42.5...47.7

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/3F25JCR311  
Type number : 0 460 484 016  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : TUD3

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.60...4.00  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 4.70...5.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Full-load del. w/out charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 20.50...21.50  
Dispersion cm3/: 2.0  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 5.00...7.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

## Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 1.50...2.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2625  
Del. quantity cm3/  
1000S.: 15.00...19.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 32.00...58.00  
mind 1000S.: 32.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Inspection-pump test specifications

# Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.00...7.80  
mm: (6.70...8.10)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1250  
TD travel mm: 3.60...4.00  
mm: (3.10...4.50)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

4th speed 1/min: 750  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

8th speed 1/min: 1000  
TD travel mm: 4.00...5.00 B  
mm: (3.30...5.70) B

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

9th speed 1/min: 500  
TD travel mm: 2.60...3.60 A  
mm: (1.90...4.30) A

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2.90...3.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1250  
Supply-pump pressure bar: 4.70...5.30

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 2450  
Supply-pump pressure bar: 7.50...8.10

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

4th speed 1/min: 500  
Supply-pump pressure bar: 3.60...5.20 A

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

## Overflow quantity at overflow valve:

1st speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)

2nd speed 1/min: 2450  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...167.90)

## Delivery-quant. and breakaway char.:

3rd speed 1/min: 2775  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/ : 3.00...9.00  
1000s.: (0.00...12.00)

5th speed 1/min: 2625  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/ : 15.00...19.00  
1000s.: (13.00...21.00)

9th speed 1/min: 2450  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/ : 20.00...22.00  
1000s.: (18.80...23.20)

12th speed 1/min: 1500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quynntity cm<sup>3</sup>/ : 20.50...21.50  
1000s.: (18.80...23.20)

20th speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.30...21.30  
1000S.: (16.80...22.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

KSB/AFB  
valve Volt: 12

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 375  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...7.00  
1000S.: (2.00...10.00)

High Idle:

1st speed 1/mi: 475  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...7.00  
1000S.: (2.00...10.00)

Residual:

1. Rotacao 1/min: 550  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.50...2.50  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 36.00...70.00  
1000S.: (36.00...70.00)

2nd speed 1/min: 300  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...30.00  
1000S.: (10.00...30.00)

4th speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...58.00  
1000S.: (32.00...58.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.1...1.5  
Ya mm: 36.2...38.2  
Yb mm: 48.5...59.5

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

A = KSB adjustment point  
B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F220GR337-4  
Type number : 0 460 484 035  
Customer Part-No. :

Customer-specific information  
Customer : SEAT

Engine : 1.9L SD Klima

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 35.50...36.50  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 575  
Del. quantity cm3/  
1000S.: 2.00...3.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2525  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...75.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: -5.00...-11.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: -0.30...-0.5 #  
Shutoff  
electromagnet Volt: 12



Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2200  
TD travel mm: 7.10...7.90  
mm: (6.80...8.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 4.30...4.90  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.50...6.10  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2200  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)

2nd speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.60...167.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2700  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2525

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)

8th speed 1/min: 2425

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...28.00  
1000S.: (17.00...29.00)

9th speed 1/min: 2200

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...33.00  
1000S.: (29.80...34.20)

12th speed 1/min: 1250

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.50...36.50  
1000S.: (33.80...38.20)

20th speed 1/min: 750

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.20...33.20  
1000S.: (28.70...34.70)

21th speed 1/min: 500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.50...32.50  
1000S.: (25.00...35.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1. Rotacao 1/min: 575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...3.00  
1000S.: (0.50...4.50)  
2nd speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...4.50  
1000S.: (1.00...6.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/ : 0.0...+3.0 Z"  
difference 1000S.: -

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : -0.8...-1.2 "  
difference mm: (-0.5...-1.5) "  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.50...-0.90"  
difference bar: (-0.3...-1.1) "

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: (35.00...75.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...38.00  
1000S.: (18.00...38.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: (35.00...75.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: 5.1...5.5
MS	mm: 1.1...1.5
SVS max.	mm: 4.6
Ya	mm: 37.6...41.6
Yb	mm: 49.9...63.3

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 02.94  
replaces : 10.04.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R463  
Type number : 0 460 484 051  
Customer Part-No. :

Customer-specific information  
Customer : FIAT-AUTO

Engine : M708 BA/FA 17.L

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 5.10...5.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 28.80...29.80

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm3/  
1000S.: 17.00...23.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...63.00  
mind 1000S.: 37.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -7.00...-13.0 #  
Shutoff

electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500

TD-travel  
difference mm: -0.70...-0.9 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 2300  
TD travel mm: 8.60...9.40  
mm: (8.30...9.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
TD travel mm: 5.10...5.50  
mm: (4.60...6.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 1.60...2.40  
mm: (1.10...2.90)

Shutoff  
electromagnet Volt: 12  
Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 2000  
TD travel mm: 7.20...8.00  
Shutoff  
electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 2300  
Supply-pump pressure bar: 7.40...8.00  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump pressure bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 600  
Supply-pump pressure bar: 3.10...3.70  
Shutoff  
electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)  
2nd speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...154.00)

# Delivery-quant. and breakaway char.:

2nd speed 1/min: 2900  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...1.60  
1000S.: (0.00...1.60)  
3rd speed 1/min: 2700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.00...9.00  
1000S.: (0.00...10.00)  
5th speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...23.00  
1000S.: (15.00...25.00)  
9th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.90...32.30  
1000S.: (28.60...33.60)  
12th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.80...29.80  
1000S.: (27.00...31.60)  
15th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.80...31.20  
1000S.: (27.70...32.30)  
20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.50...31.50  
1000S.: (26.50...33.50)

# Mech. shutoff:

# Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

# Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)  
2nd speed 1/min: 650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)  
3rd speed 1/min: 550

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: (0.00...10.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: -7.0...-9.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.00...59.00  
1000S.: (43.00...59.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...42.00  
1000S.: (32.00...42.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...63.00  
1000S.: (37.00...63.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.6...2.0  
Ya mm: 37.2...39.2  
Yb mm: 47.8...56.2

Remarks:

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR  
Edition : 08.02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2400R495  
Type number : 0 460 484 063  
Customer Part-No. :

Customer-specific information  
Customer : FORD

Engine : 1,8 L IDI NA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 0.85  
mm: +0.02(0.06)

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 6.50...6.90

AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 6.40...7.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1750  
Del. quantity cm3/  
1000S.: 31.00...31.40

KSB/AFB 11  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 6.00...10.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 530  
Del. quantity cm3/  
1000S.: 1.00...5.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2625  
Del. quantity cm3/  
1000S.: 9.50...15.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
 Del. quantity cm3/: 50.00...70.00  
 mind 1000S.: 50.00  
 KSB/AFB  
 Valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

Speed 1/min: 1200  
 Inj.-qty. cm3/  
 difference 1000S.: -5.20...-13.20 #  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1200  
 TD-travel  
 difference mm: -1.50...-1.70#  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
 TD travel mm: 8.40...9.20  
 mm: (8.00...9.60)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1500  
 TD travel mm: 6.50...6.90  
 mm: (6.00...7.40)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 800  
 TD travel mm: 2.80...3.60  
 mm: (2.40...4.00)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 8th speed 1/min: 1000  
 TD travel mm: 2.80...5.20 B  
 mm: (2.70...5.30) B

KSB/AFB  
 valve Volt: -

Shutoff  
 electromagnet Volt: 12  
 9th speed 1/min: 400  
 TD travel mm: 3.40...3.60 A  
 mm: (2.50...4.50) A

KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
 Supply-pump  
 pressure bar: 4.10...4.70

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

2nd speed 1/min: 1500  
 Supply-pump  
 pressure bar: 6.40...7.00

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

3rd speed 1/min: 2000  
 Supply-pump  
 pressure bar: 7.90...8.50

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...86.10  
 quantity cm3/10s: (26.70...101.10)

2nd speed 1/min: 2400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2950  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...2.00  
 1000S.: (0.00...2.00)  
 5th speed 1/min: 2625  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.50...15.50  
 1000S.: (8.00...17.00)  
 8th speed 1/min: 2550  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...23.00  
 1000S.: (13.00...25.00)  
 9th speed 1/min: 2400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.10...27.10  
 1000S.: (24.10...28.10)  
 12th speed 1/min: 1750  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 31.00...31.40  
 1000S.: (29.50...32.90)  
 15th speed 1/min: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.70...31.70  
 1000S.: (27.90...32.50)  
 20th speed 1/min: 750  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.50...31.50  
 1000S.: (27.70...32.30)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12

Damper set qty.:

LFG-setting:

L20

solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 425  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.00...10.00  
 1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 570  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 11.00...15.00  
 1000S.: (9.00...17.00)

Residual:

1.Rotacao 1/min: 530  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 1.00...5.00  
 1000S.: (0.20...5.80)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/ : -5.0...7.0 "  
 difference 1000S.: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/: +2.0...+8.0 Z'  
 difference 1000S.: -

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):

1st speed 1/min: 1200  
 TD-travel : -1.7...-2.5 '  
 difference mm: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1200



Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 275  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
1000S.: (50.00...80.00)

2nd speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.00...40.00  
1000S.: LFG- 570 VH— VL

3rd speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.00...36.00  
1000S.: LFG- 425 VH— VL

4th speed 1/min: 200  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...70.00  
1000S.: LFG- 425 VH— VL

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -  
KF mm: KOT  
MS mm: 2.1...2.3  
Ya mm: 31.8...35.8  
Yb mm: 38.0...47.0

Ya = Distance between VE flange and  
speed-control lever in idle  
position :  
Measurement point = edge of control

Lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

A = KSB adjustment point  
B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R537  
Type number : 0 460 484 067  
Customer Part-No. :

Customer-specific information  
Customer : FIAT-AUTO

Engine : M708 HT 17.L

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 4.00...4.20  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

L22

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1000  
Setting value bar: 5.20...5.80  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 41.00...42.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/ 2.5  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 28.00...29.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

11

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 10.00...14.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/ 2.5  
1000S.: (2.5)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 29.00...33.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 35.00...59.00

mind 1000S.: 35.00

KSB/AFB

Valve Volt: 12

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000

Charge press hPa: 1000

TD travel mm: 6.50...7.10

mm: (6.20...7.40)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Charge press hPa: 1000

TD travel mm: 4.00...4.20

mm: (3.50...4.70)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 1000

Charge press hPa: 1000

TD travel mm: 1.10...1.70

mm: (0.80...2.00)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

5th speed 1/min: 2300

Charge press. hPa: 1000

TD travel mm: 7.90...8.50

mm: (7.60...8.80)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

8th speed 1/min: 1000

Charge press. hPa: 1000

TD travel mm: 2.00...4.00 B

mm: -

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 12

9th speed 1/min: 400

Charge press. hPa: 1000

TD travel mm: 2.50...4.50 A

mm: -

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2300

Charge press. hPa: 1000

Supply-pump

pressure bar: 7.30...7.90

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Charge press. hPa: 1000

Supply-pump

pressure bar: 5.20...5.80

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 1000

Charge press. hPa: 1000

Supply-pump

pressure bar: 3.90...4.50

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750

Charge press. hPa: -

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow : 41.70...83.40

quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 2300

Charge press. hPa: 1000

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow : 55.60...139.00

quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 1100

Charge-air pressure-setting  
point hPa: 350

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 37.00...38.00

1000S.: (34.50...40.50)

2nd speed 1/min: 2900

Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 2700  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 4.50...12.50  
 1000S.: (3.50...13.50)  
 5th speed 1/min: 2500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 29.00...33.00  
 1000S.: (26.00...36.00)  
 9th speed 1/min: 2300  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...43.00  
 1000S.: (39.00...44.00)  
 12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 41.00...42.00  
 1000S.: (39.20...43.80)  
 16th speed 1/min: 1100  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm3/: 29.00...32.00  
 1000H.: -  
 18th speed 1/min: 750  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 28.00...29.00  
 1000S.: (25.50...31.50)  
 20th speed 1/min: 750  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 38.00...41.00  
 1000S.: (37.00...42.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12

Idle delivery:

1st speed 1/min: 450  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...14.00  
 1000S.: (7.00...17.00)

Dispersion cm3/: 2.5  
 1000S.: (2.5)

2nd speed 1/min: 550  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 20.50...25.50  
 1000S.: -

Part-load del. at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0

1st speed 1/min: 1100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 19.0...21.00  
 1000S.: (17.50...22.50)

Automatic starting fuel delivery:

1st speed 1/min: 300  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 37.00...57.00  
 1000S.: (37.00...57.00)

2nd speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 17.00...37.00  
 1000S.: (17.00...37.00)

4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.00...59.00  
 1000S.: (35.00...59.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: 3.2...3.4  
 KF mm: 5.2...5.6  
 MS mm: 0.8...1.2  
 Ya mm: 37.2...39.2  
 Yb mm: 40.4...49.0

Ajustement Potentiometer:

Supply voltage  
 pot. volt: 5.0  
 Output volt  
 pot. volt: 3.32

Remarks:

:  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control

lever on distributor-head end

A = KSB adjustment point  
 B = KSB curve point

Pump with slave plunger

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 02.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R538  
Type number : 0 460 484 068  
Customer Part-No. :

Customer-specific information  
Customer : FIAT-AUTO

Engine : M708 HT 17.L

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 4.00...4.20  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

L26

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1000  
Setting value bar: 5.20...5.80  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 41.00...42.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/ 2.5  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 28.00...29.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

11

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 10.00...14.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/ 2.5  
1000S.: (2.5)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 29.00...33.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 35.00...59.00  
mind 1000S.: 35.00

KSB/AFB

Valve Volt: 12

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000

Charge press hPa: 1000

TD travel mm: 6.50...7.10  
mm: (6.20...7.40)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Charge press hPa: 1000

TD travel mm: 4.00...4.20  
mm: (3.50...4.70)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 1000

Charge press hPa: 1000

TD travel mm: 1.10...1.70  
mm: (0.80...2.00)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

5th speed 1/min: 2300

Charge press. hPa: 1000

TD travel mm: 7.90...8.50  
mm: (7.60...8.80)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

8th speed 1/min: 1000

Charge press. hPa: 1000

TD travel mm: 2.00...4.00 B  
mm: -

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 12

9th speed 1/min: 400

Charge press. hPa: 1000

TD travel mm: 2.50...4.50 A  
mm: -

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2300

Charge press. hPa: 1000

Supply-pump

pressure bar: 7.30...7.90

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Charge press. hPa: 1000

Supply-pump

pressure bar: 5.20...5.80

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 1000

Charge press. hPa: 1000

Supply-pump

pressure bar: 3.90...4.50

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750

Charge press. hPa: -

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow : 41.70...83.40

quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 2300

Charge press. hPa: 1000

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Overflow : 55.60...139.00

quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 1100

Charge-air pressure-setting  
point hPa: 350

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 37.00...38.00  
1000S.: (34.50...40.50)

2nd speed 1/min: 2900

Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 2700  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 4.50...12.50  
 1000S.: (3.50...13.50)  
 5th speed 1/min: 2500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.00...33.00  
 1000S.: (26.00...36.00)  
 9th speed 1/min: 2300  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...43.00  
 1000S.: (39.00...44.00)  
 12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 41.00...42.00  
 1000S.: (39.20...43.80)  
 16th speed 1/min: 1100  
 Charge press. hPa: -  
 KSB solenoid-operated  
 valve volt: 12  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.00...32.00  
 1000H.: -  
 18th speed 1/min: 750  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.00...29.00  
 1000S.: (25.50...31.50)  
 20th speed 1/min: 750  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 38.00...41.00  
 1000S.: (37.00...42.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12

Idle delivery:

1st speed 1/min: 450  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
 1000S.: (7.00...17.00)

Dispersion cm<sup>3</sup>/: 2.5  
 1000S.: (2.5)

2nd speed 1/min: 550  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 20.50...25.50  
 1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 300  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 37.00...57.00  
 1000S.: (37.00...57.00)

2nd speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 17.00...37.00  
 1000S.: (17.00...37.00)



4th speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...59.00  
1000s.: (35.00...59.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.2...5.6  
MS mm: 0.8...1.2  
Ya mm: 37.2...39.2  
Yb mm: 40.4...49.0

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

A = KSB adjustment point  
B = KSB curve point

Pump with slave plunger

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R536  
Type number : 0 460 484 069  
Customer Part-No. :

Customer-specific information  
Customer : VW ECO

Engine : 1.9

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 35.50...36.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 5.50...6.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm3/  
1000S.: 18.00...28.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...61.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: -4.5...-10.5 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: -0.6...-0.8 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 5.80...6.60  
mm: (5.50...6.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.00...3.40  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Supply-pump  
pressure bar: 6.90...7.50

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply-pump  
pressure bar: 4.90...5.50

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Supply-pump  
pressure bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
2nd speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...28.00  
1000S.: (17.00...29.00)

3rd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.0...14.00  
1000S.: (8.00...16.00)

5th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...33.50  
1000S.: (30.30...34.70)

6th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.50...36.50  
1000S.: (33.80...38.20)

7th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.50...33.50  
1000S.: (29.00...35.00)

8th speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...36.50  
1000S.: (29.00...39.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

## High Idle:

1st speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

## Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...6.50  
1000S.: (4.00...8.00)  
2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...8.00  
1000S.: (4.50...9.50)

## Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Inj.-qty. cm<sup>3</sup>/: -5.5...-7.5 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 Z'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : -1.3...-1.7 '  
difference mm: (-1.0...-2.0) '  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply pump-  
pressure : -0.7...-1.1 '  
difference bar: (-0.5...-1.3) '  
Shutoff  
electromagnet Volt: 12

## Automatic starting fuel delivery:

1st speed 1/min: 308  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.00...38.00  
1000S.: (18.00...38.00)

2nd speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...69.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...61.00  
1000S.: -

## Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

## Mounting and assembly dimensions:

### Designation

K	mm: 3.2...3.4
KF	mm: 5.1...5.5
MS	mm: 1.2...1.4
Ya	mm: 37.6...41.6
Yb	mm: 44.0...54.0

### Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

Z = Absolute delivery

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 s.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2050R588  
Type number : 0 460 484 073  
Customer Part-No. :

Customer-specific information  
Customer : RENAULT

Engine : F8Q - 640

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1500  
Setting value mm: 2.40...2.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 6.50...7.10  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 33.00...34.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 410  
Del. quantity cm3/  
1000S.: 7.50...11.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

## Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 1.00...5.00

Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2150  
Del. quantity cm3/  
1000S.: 24.50...30.50

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 4.60...5.40  
mm: (4.30...5.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500

TD travel mm: 2.40...2.80  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 1250

TD travel mm: 1.00...1.80  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump  
pressure bar: 3.50...4.10

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1500

Supply-pump  
pressure bar: 6.50...7.10

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 2000

Supply-pump  
pressure bar: 8.00...8.60

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)

2nd speed 1/min: 2000

Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2550

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

3rd speed 1/min: 2250

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...20.00  
1000S.: (11.00...21.00)

5th speed 1/min: 2150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.50...30.50  
1000S.: (23.50...31.50)

9th speed 1/min: 2000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.20...31.20  
1000S.: (27.90...32.50)

10th speed 1/min: 1625

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.40...33.40  
1000S.: (29.60...34.20)

12th speed 1/min: 1250

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.00...34.00  
1000S.: (31.20...35.80)

15th speed 1/min: 750

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.50...35.50  
1000S.: (31.70...36.30)

20th speed 1/min: 500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...34.50  
1000S.: (30.70...35.30)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 410  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 410

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.50...11.50  
1000S.: (5.50...13.50)

High Idle:

1st speed 1/mi: 450

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (5.00...13.00)

Residual:

1.Rotacao 1/min: 500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 1.00...5.00  
1000S.: (1.00...5.00)

ccm/1000 S.

Automatic starting fuel delivery:

1st speed 1/min: 210

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

2nd speed 1/min: 310

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: (15.00...45.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.2...3.4

KF mm: 5.3...5.5

MS mm: 1.2...1.4

SVS max. mm: 3.3

Ya mm: 16.0...20.0

Yb mm: 65.9...77.7

Remarks:

:  
:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0

M08



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column:

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L358-4  
Type number : 0 460 485 007  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2,4L SD T4

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 36.00...37.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6.50...7.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -3.50...-9.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500

TD-travel  
difference mm: -0.30...-0.50#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1790  
TD travel mm: 5.30...6.10  
mm: (5.00...6.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.80...4.40

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Supply-pump  
pressure bar: 8.10...8.70  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.80...98.40)  
2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)

8th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...27.00  
1000S.: (16.00...28.00)

9th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...32.00  
1000S.: (28.80...33.20)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...37.00  
1000S.: (34.30...38.70)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...35.00  
1000S.: (30.50...36.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 465  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

# Residual:

1. Rotacao 1/min: 540  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.50...7.50  
1000S.: (6.00...10.00)  
2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.80...8.80  
1000S.: (6.30...11.30)

# Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm3/ : -6.0...-8.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Inj.-qty. cm3/ : 0.0...+3.0 Z'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -1.7...-2.1 '  
difference mm: (-1.3...-2.50)'  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.10...-0.30"  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply pump-  
pressure : -0.8...-1.2 '  
difference bar: -

# Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...85.00  
1000S.: (35.00...85.00)

# Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

# Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: KOT  
MS mm: 1.3...1.5  
SVS max. mm: 1.9  
Ya mm: 32.8...34.8  
Yb mm: 60.5...71.5

# Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L453-4  
Type number : 0 460 485 009  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2,4L WK T4 KLIMA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 36.00...37.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6.50...7.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -3.50...-9.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500

TD-travel  
difference mm: -0.30...-0.50#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1790  
TD travel mm: 5.30...6.10  
mm: (5.00...6.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.80...4.40

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Supply-pump  
pressure bar: 8.10...8.70  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.80...98.40)  
2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)  
5th speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)  
8th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...27.00  
1000S.: (16.00...28.00)  
9th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...32.00  
1000S.: (28.80...33.20)  
12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...37.00  
1000S.: (34.30...38.70)  
20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...35.00  
1000S.: (30.50...36.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 465  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

#### Residual:

1. Rotacao 1/min: 540  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.50...7.50  
1000S.: (6.00...10.00)  
2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.80...8.80  
1000S.: (6.30...11.30)

#### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: -6.0...-8.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 Z'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -1.7...-2.1 '  
difference mm: (-1.3...-2.50) '  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.10...-0.30 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply pump-  
pressure : -0.8...-1.2 '  
difference bar: -

#### Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

#### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

##### Designation

K	mm: 3.2...3.4
KF	mm: KOT
MS	mm: 1.3...1.5
SVS max.	mm: 1.9
Ya	mm: 32.8...34.8
Yb	mm: 62.5...68.5

#### Ajustement Potentiometer:

Supply voltage  
pot. volt: 5.0  
Output volt  
pot. volt: 0.8

#### Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L457  
Type number : 0 460 485 010  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2,4l SD T4

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1250  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 36.00...37.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

## Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6.50...7.50  
Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...61.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -3.50...-9.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500

TD-travel  
difference mm: -0.30...-0.50#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1790  
TD travel mm: 5.30...6.10  
mm: (5.00...6.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.80...4.40

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Supply-pump  
pressure bar: 8.10...8.70  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.80...98.40)  
2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)  
5th speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)  
8th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...27.00  
1000S.: (16.00...28.00)  
9th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...32.00  
1000S.: (28.80...33.20)  
12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...37.00  
1000S.: (34.30...38.70)  
20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...35.00  
1000S.: (30.50...36.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1.Rotacao 1/min: 540  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.50...7.50  
1000S.: (6.00...10.00)



2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.80...8.80  
1000S.: (5.30...10.80)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

2nd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 Z'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -1.7...-2.1 '  
difference mm: (-1.3...-2.50)'  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply pump-  
pressure : -0.8...-1.2 '  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...69.00  
1000S.: (35.00...69.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...61.00  
1000S.: (35.00...61.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: KOT

MS mm: 1.3...1.5  
SVS max. mm: 1.9  
Ya mm: 32.8...34.8  
Yb mm: 60.5...71.5

Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VES/8F2100L545  
Type number : 0 460 485 017  
Customer Part-No. :

Customer-specific information  
Customer : VW 153

Engine : 2,4L T4

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 36.00...37.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6.50...7.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: -3.50...-9.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1500  
TD-travel  
difference mm: -0.30...-0.50#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1790  
TD travel mm: 5.00...5.80  
mm: (4.70...6.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Supply-pump  
pressure bar: 5.00...5.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Supply-pump  
pressure bar: 7.20...7.80

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.80...98.40)

2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)

8th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...27.00  
1000S.: (16.00...28.00)

9th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...32.00  
1000S.: (28.80...33.20)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...37.00  
1000S.: (34.30...38.70)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.30...35.30  
1000S.: (30.80...36.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1.Rotacao 1/min: 540  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 6.50...7.50  
1000S.: (5.00...9.00)  
2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.80...8.80  
1000S.: (5.30...10.30)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: -6.0...-8.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 Z'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -1.9...-2.3 Z'  
difference mm: (-1.5...-2.70)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.10...-0.30"  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply pump-  
pressure : -0.8...-1.2 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100

M20

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.3...1.5  
SVS max. mm: 4.9  
Ya mm: 32.8...34.8  
Yb mm: 60.5...71.5

Ajustement Potentiometer:

Supply voltage  
pot. volt: 5.0  
Output volt  
pot. volt: 0.8

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L545-4  
Type number : 0 460 485 018  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2,4L SD T4 KLIMA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1250  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 36.00...37.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

## Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6.50...7.50  
Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -3.50...-9.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500

TD-travel  
difference mm: -0.30...-0.50#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1790  
TD travel mm: 5.30...6.10  
mm: (5.00...6.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Supply-pump  
pressure bar: 5.00...5.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1790  
Supply-pump  
pressure bar: 7.20...7.80  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.80...98.40)

2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000s.: (0.00...6.00)

5th speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000s.: (8.00...16.00)

8th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...27.00  
1000s.: (16.00...28.00)

9th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...32.00  
1000s.: (28.80...33.20)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...37.00  
1000s.: (34.30...38.70)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.30...35.30  
1000s.: (30.80...36.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000s.: (4.00...12.00)

High Idle:

1st speed 1/mi: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000s.: (4.00...12.00)

# Residual:

1. Rotacao 1/min: 540  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.50...7.50  
1000S.: (5.00...9.00)  
2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.80...8.80  
1000S.: (5.30...10.30)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: -6.0...-8.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 Z'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -1.7...-2.1 '  
difference mm: (-1.3...-2.50)'  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.10...-0.30"  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply pump-  
pressure : -0.8...-1.2 '  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380

M23

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.3...1.5  
SVS max. mm: 1.9  
Ya mm: 32.8...34.8  
Yb mm: 60.5...71.5

Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L457-1  
Type number : 0 460 485 019  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2,4l WK-SD T4 CAMPER

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1500  
Setting value mm: 4.10...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 7.10...7.70  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 35.00...36.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

## Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6.50...7.50

Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -7.50...-13.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500



TD-travel  
difference mm: -1.10...-1.30#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1790  
TD travel mm: 5.90...6.70  
mm: (5.60...7.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
TD travel mm: 4.10...4.50  
mm: (3.60...5.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1100  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1100  
Supply-pump  
pressure bar: 5.90...6.50

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump  
pressure bar: 7.10...7.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1790  
Supply-pump  
pressure bar: 7.80...8.40  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.80...98.30)  
2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (40.70...167.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)  
5th speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)  
8th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...27.00  
1000S.: (16.00...28.00)  
9th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.50...30.50  
1000S.: (27.30...31.70)  
10th speed 1/min: 1850  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.50...35.50  
1000S.: -  
12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...36.00  
1000S.: (33.30...37.70)  
20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.80...34.80  
1000S.: (30.30...36.30)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1. Rotacao 1/min: 540  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.50...7.50  
 1000S.: (5.00...9.00)  
 2nd speed 1/min: 490  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.80...8.80  
 1000S.: (5.30...10.30)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
 Inj.-qty. cm<sup>3</sup>/ : -6.0...-8.0 "  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1500  
 Inj.-qty. cm<sup>3</sup>/ : 0.0...+3.0 Z'  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1500  
 TD-travel : -1.9...-2.3 '  
 difference mm: (-1.5...-2.7)'  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1500  
 Supply pump-  
 pressure : -0.10...0.30"  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1500  
 Supply pump-  
 pressure : -0.8...-1.2 '  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.00...85.00  
 1000S.: (35.00...85.00)

2nd speed 1/min: 380  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 17.00...37.00  
 1000S.: (17.00...37.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.00...85.00  
 1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: 3.2...3.4  
 KF mm: 5.6...6.0  
 MS mm: 1.3...1.5  
 Ya mm: 32.8...34.8  
 Yb mm: 60.5...71.5

Remarks:

Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

Pump with slave plunger

Z = Absolute delivery

On initial measurement, screw in  
 residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
 residual-quantity adjusting screw 2 mm.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2250R449  
Type number : 0 460 494 297  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : J8S - 786 R21

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 51.00...52.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 38.50...39.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2,5)

Residual-Delivery Setting

Speed 1/min: 525  
Del. quantity cm3/  
1000S.: 3.50...7.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 7.50...13.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...90.00  
mind 1000S.: 50.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: -  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: -7.50...-11.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
Charge press hPa: -  
TD-travel  
difference mm: -1.2...-1.4 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2125  
Charge press hPa: 1000  
TD travel mm: 6.80...7.60  
mm: (6.50...7.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 3.40...3.80  
mm: (3.10...4.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.10...2.90  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.40...5.00

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.10...5.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2125  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 7.50...8.10  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)  
2nd speed 1/min: 2125  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 6,4  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.50...46.50  
1000S.: (43.00...49.00)

2nd speed 1/min: 2700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.50...13.50  
1000S.: (6.50...14.50)

8th speed 1/min: 2350  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.50...37.50  
1000S.: (28.50...38.50)

9th speed 1/min: 2125  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 48.10...50.10  
1000S.: (46.80...51.40)

11th speed 1/min: 1625  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 48.90...50.90  
 1000S.: (47.60...52.20)  
 12th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 51.00...52.00  
 1000S.: (49.20...53.80)  
 15th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 50.60...53.60  
 1000S.: (49.10...55.10)  
 16th speed 1/min: 1250  
 Charge press. hPa: -  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm3/: 36.60...39.60  
 1000H.: (35.10...41.10)  
 18th speed 1/min: 750  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 38.50...39.50  
 1000S.: (36.00...42.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

Damper set qty.:

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 13.00...17.00  
 1000S.: (11.00...19.00)

High Idle:

1st speed 1/mi: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 6.00...10.00  
 1000S.: (4.00...12.00)

Residual:

1.Rotacao 1/min: 525

NO1

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 3.50...7.50  
 1000S.: (3.50...7.50)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
 Charge press. hPa: -  
 Inj.-qty. cm3/ : -4.5...-6.5 "  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: -  
 Inj.-qty. cm3/: +2.0...+8.0'2  
 difference 1000S.: -

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1250  
 Charge press. hPa: -  
 TD-travel : -1.9...-2.7 '  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1250  
 Charge press. hPa: -  
 Supply pump-  
 pressure : -0.1...-0.3 "  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0

1st speed 1/min: 825  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 29.50...30.50  
 1000S.: (27.50...32.50)

Automatic starting fuel delivery:

1st speed 1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 50.00...90.00  
 1000S.: (50.00...90.00)

2nd speed 1/min: 350

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 20.00...50.00  
1000S.: (20.00...50.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 50.00...90.00  
1000S.: (50.00...90.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.6...3.8

KF mm: KOT

MS mm: 1.3...1.5

SVS max. mm: 2.8

LDA stroke mm: 6.4

XK mm: LD=5.6..6.4

Ya mm: 38.8...42.8

Yb mm: 36.2...45.8

Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

Microswitch

Gap A = 1.0...2.5 mm

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2250R449-1  
Type number : 0 460 494 298  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : J8S - 786 R21

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

N03

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 51.00...52.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 38.50...39.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2,5)

Residual-Delivery Setting

Speed 1/min: 525  
Del. quantity cm3/  
1000S.: 3.50...7.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 7.50...13.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...90.00  
mind 1000S.: 50.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: -  
Inj.-qty. cm3/  
difference 1000S.: -7.50...-11.50 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
Charge press hPa: -  
TD-travel  
difference mm: -1.2...-1.4 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2125  
Charge press hPa: 1000  
TD travel mm: 6.80...7.60  
mm: (6.50...7.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 3.40...3.80  
mm: (3.10...4.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.10...2.90  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2125  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 7.50...8.10  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm3/10s: (26.70...101.10)  
2nd speed 1/min: 2125  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 6.4  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.50...46.50  
1000S.: (43.00...49.00)

2nd speed 1/min: 2700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.50...13.50  
1000S.: (6.50...14.50)

8th speed 1/min: 2350  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 29.50...37.50  
1000S.: (28.50...38.50)

9th speed 1/min: 2125  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 48.10...50.10  
1000S.: (46.80...51.40)

11th speed 1/min: 1625  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12



Del. quantity cm<sup>3</sup>/: 48.90...50.90  
 1000S.: (47.60...52.20)  
 12th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 51.00...52.00  
 1000S.: (49.20...53.80)  
 15th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.60...53.60  
 1000S.: (49.10...55.10)  
 16th speed 1/min: 1250  
 Charge press. hPa: -  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.60...39.60  
 1000H.: (35.10...41.10)  
 18th speed 1/min: 750  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 38.50...39.50  
 1000S.: (36.00...42.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

Damper set qty.:

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.00...17.00  
 1000S.: (11.00...19.00)

High Idle:

1st speed 1/mi: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.00...10.00  
 1000S.: (4.00...12.00)

Residual:

1.Rotacao 1/min: 525

N05

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 3.50...7.50  
 1000S.: (3.50...7.50)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
 Charge press. hPa: -  
 Inj.-qty. cm<sup>3</sup>/: -4.5...-6.5 "  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: -  
 Inj.-qty. cm<sup>3</sup>/: +2.0...+8.0'Z  
 difference 1000S.: -

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1250  
 Charge press. hPa: -  
 TD-travel : -1.9...-2.7 '  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1250  
 Charge press. hPa: -  
 Supply pump-  
 pressure : -0.1...-0.3 "  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0

1st speed 1/min: 825  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.50...30.50  
 1000S.: (27.50...32.50)

Automatic starting fuel delivery:

1st speed 1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.00...90.00  
 1000S.: (50.00...90.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...50.00  
1000S.: (20.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...90.00  
1000S.: (50.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS mm: 1.3...1.5  
SVS max. mm: 2.8  
LDA stroke mm: 6.4  
XK mm: LD=5.6..6.4  
Ya mm: 38.8...42.8  
Yb mm: 36.2...45.8

Remarks:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

Microswitch  
Gap A = 1.0...2.5 mm

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2250R328-7  
Type number : 0 460 494 312  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1.6L TD/LLK B3

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value mm: 3.80...4.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

N07

Speed 1/min: 1500  
Charge press hPa: 750  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 42.00...43.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 27.60...28.20

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 465  
Del. quantity cm3/  
1000S.: 12.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 615  
Del. quantity cm3/  
1000S.: 4.00...5.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2525  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2250  
Charge press hPa: 750  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press hPa: 750  
TD travel mm: 3.80...4.20  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 750  
TD travel mm: 1.80...2.60  
mm: (1.50...2.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 3.30...3.90

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 7.70...8.30

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)

2nd speed 1/min: 2250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 900  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.10...34.70  
1000s.: (31.40...37.40)

2nd speed 1/min: 2650  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000s.: (0.00...6.00)

5th speed 1/min: 2525  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000s.: (11.00...19.00)

8th speed 1/min: 2425  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.50...36.50  
1000s.: (25.50...37.50)

9th speed 1/min: 2250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.30...38.30  
1000s.: (35.10...39.50)

12th speed 1/min: 1500  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...43.00  
1000s.: (40.30...44.70)

16th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 28.20...30.60  
1000H.: (27.90...30.90)

18th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.60...28.20  
1000s.: (24.90...30.90)

20th speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.00...37.00  
1000s.: (32.50...38.50)

21th speed 1/min: 400  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.90...34.90  
1000S.: (31.70...35.10)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 465  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 465  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...14.00  
1000S.: (7.50...18.50)

High Idle:

1st speed 1/mi: 515  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...14.00  
1000S.: (8.00...18.00)

Residual:

1. Rotacao 1/min: 615  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 4.00...5.00  
1000S.: (1.50...7.50)  
2nd speed 1/min: 565  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...7.50  
1000S.: (3.00...10.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: K1  
KF mm: 5.6...6.0  
MS mm: 1.3...1.5  
SVS max. mm: 3.9  
Ya mm: 37.6...41.6  
Yb mm: 49.9...63.3

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2300R433-3  
Type number : 0 460 494 314  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1,9 L UD -A3

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 750  
Setting value mm: 4.30...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 750  
Setting value bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 50.00...51.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 37.20...43.20

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 16.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 7.00...8.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 9.00...13.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.0...43.00  
mind 1000S.: 37.0

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: -  
Inj.-qty. cm3/  
difference 1000S.: -7.0...-11.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
Charge press hPa: -  
TD-travel  
difference mm: -1.9...-2.1 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 750  
TD travel mm: 8.00...8.60  
mm: (7.60...9.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 750  
TD travel mm: 4.30...4.50  
mm: (3.70...5.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 750  
TD travel mm: 1.50...2.10  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 4.30...4.90  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 5.40...6.00  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2100  
Charge press. hPa: 750

Supply-pump  
pressure bar: 7.40...8.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm3/10s: (29.10...98.60)  
2nd speed 1/min: 2100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm3/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2600  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 9.00...13.00  
1000S.: (7.00...15.00)

8th speed 1/min: 2400  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 32.50...42.50  
1000S.: (31.50...43.50)

9th speed 1/min: 2100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.00...44.00  
1000S.: (40.80...45.20)

12th speed 1/min: 1250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...51.00  
1000S.: (48.30...52.70)

20th speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 43.50...46.50  
1000S.: (42.80...47.20)

21th speed 1/min: 450

Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.20...43.20  
1000S.: (34.70...45.70)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.00...18.00  
1000S.: (13.00...21.00)

High Idle:

1st speed 1/mi: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.00...18.00  
1000S.: (13.00...21.00)

Residual:

1.Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...8.00  
1000S.: (5.50...9.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: -4.5...-6.5 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: +0.0...+3.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: -  
TD-travel : -2.50...-2.9 "  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Charge press. hPa: -  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: -  
Supply pump-  
pressure : -1.0...-1.4 "  
difference bar: -

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.00...36.00  
1000S.: (32.00...38.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...55.00  
1000S.: (35.00...55.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...51.00  
1000S.: (31.00...51.00)

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (32.50...47.50)

Shutoff electromagnet:



Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS	mm: 1.0...1.4
Ya	mm: 37.6...41.6
Yb	mm: 49.9...63.3

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Pump in stepped LDA

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2200R420-14  
Type number : 0 460 494 323  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1.9L UD B3 Klima

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.70...4.10  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 42.00...43.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 9.00...11.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 575  
Del. quantity cm3/  
1000S.: 5.50...6.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...65.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: -4.0...-10.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: -0.6...-0.8 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 6.60...7.40  
mm: (6.30...7.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.70...4.10  
mm: (3.20...4.60)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 4.30...4.90  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.50...6.10  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2200  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)

2nd speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm<sup>3</sup>/10s: (41.70...164.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000s.: (0.00...6.00)

3rd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.0...14.00  
1000s.: (8.00...16.00)

5th speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 21.50...31.50  
1000s.: (20.50...32.50)

8th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.70...38.70  
1000s.: (35.50...39.90)

9th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...43.00  
1000s.: (40.30...44.70)

12th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.70...36.70  
1000s.: (32.20...38.20)

15th speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.50...41.50  
1000s.: (33.00...44.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000s.: (6.00...14.00)

High Idle:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (6.00...14.00)

Residual:

1. Rotacao 1/min: 575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...6.50  
1000S.: (4.00...8.00)  
2nd speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.30...9.30  
1000S.: (5.80...10.80)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: -5.0...-7.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : -1.8...-2.2 #  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.1...0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply pump-  
pressure : -1.1...1.5 "  
difference bar: -

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...29.00  
1000S.: (25.00...31.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: (35.00...75.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...50.00  
1000S.: (30.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.1...5.5  
MS mm: 1.1...1.5  
SVS max. mm: 2.9  
Ya mm: 37.6...41.6  
Yb mm: 49.9...63.3

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

Z = Absolute delivery

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2350R309-4  
Type number : 0 460 494 325  
Customer Part-No. :

Customer-specific information  
Customer : RENAULT

Engine : J8S - 600 CA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1125  
Setting value mm: 2.60...3.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1125  
Setting value bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1125  
Del. quantity cm3/  
1000S.: 36.20...37.20  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 4.00...8.00  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm3/  
1000S.: 20.00...26.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 52.00...92.00  
mind 1000S.: 52.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1125  
Inj.-qty. cm3/  
difference 1000S.: -11.0...-15.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1125

TD-travel  
difference mm: -0.5...-0.7 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.10...7.90  
mm: (6.80...8.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1125  
TD travel mm: 2.60...3.00  
mm: (2.10...3.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1125  
Supply-pump  
pressure bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.50...7.10  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)  
3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...10.50  
1000S.: (1.50...11.50)  
5th speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...26.00  
1000S.: (19.00...27.00)  
9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.20...37.20  
1000S.: (33.90...38.50)  
10th speed 1/min: 1750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.90...36.90  
1000S.: (33.60...38.20)  
12th speed 1/min: 1125  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.20...37.20  
1000S.: (34.40...39.00)  
20th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.70...36.70  
1000S.: (32.90...37.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (11.00...19.00)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 8.50...12.50  
1000S.: (6.50...14.50)

Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.00...8.00  
1000S.: (4.00...8.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1125  
Inj.-qty. cm3/ : -10.0...-12.0"  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1125  
Inj.-qty. cm3/ : +2.0...+8.0 'Z  
difference 1000S.: -

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1125  
TD-travel : -1.0...-1.60 '  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1125  
Supply pump-  
pressure : -0.10...-0.30"  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.00...85.00  
1000S.: (45.00...85.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 25.00...45.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12

N20

Del. quantity cm3/: 52.00...92.00  
1000S.: (52.00...92.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.3...1.7  
SVS max. mm: 3.0  
XK mm: LD11.8.12.2  
XL mm: LP=0.4...1.5  
Ya mm: 37.8...41.8  
Yb mm: 45.1...54.9

Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

Z = Absolute delivery



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2250R513  
Type number : 0 460 494 341  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD 9 TF-Y

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

N21

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 53.50...54.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 36.50...37.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 12.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 6.00...7.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2575  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 12.00...16.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 150  
Del. quantity cm3/: 37.00...67.00  
mind 1000S.: 37.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/  
difference 1000s.: -11.0...-15.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: -0.9...-1.1 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 3.40...3.80  
mm: (2.90...4.30)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.30...7.90

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2150  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 5.9  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.00...47.00  
1000s.: (43.50...49.50)  
2nd speed 1/min: 2750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000s.: (0.00...6.00)  
5th speed 1/min: 2575  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...16.00  
1000s.: (10.00...18.00)  
8th speed 1/min: 2375  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.00...43.00  
1000s.: (32.00...44.00)  
9th speed 1/min: 2150  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.50...51.50  
1000s.: (48.30...52.70)  
10th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 51.00...53.00  
1000s.: (49.80...54.20)  
12th speed 1/min: 1250

Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 53.50...54.50  
                           1000S.: (51.80...56.20)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 37.50...38.50  
                           1000S.: (35.00...41.00)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 46.50...49.50  
                           1000S.: (45.00...51.00)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 2000  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

Damper set qty.:

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 12.00...14.00  
                           1000S.: (9.00...17.00)

High Idle:

1st speed 1/mi: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 11.00...13.00  
                           1000S.: (8.00...16.00)

Residual:

1. Rotacao 1/min: 500

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.00...7.00  
                           1000S.: (4.50...8.50)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
 Inj.-qty. cm<sup>3</sup>/ : -9.0...-11.0"  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Inj.-qty. cm<sup>3</sup>/ : +0.2...+8.0 Z'  
 difference 1000S.: -  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1250  
 TD-travel : -2.1...-2.5 '  
 difference mm: -  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1250  
 Supply pump-  
 pressure : -0.1...-0.3 "  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Supply pump-  
 pressure : -0.9...-1.3 '  
 difference bar: -  
 Shutoff  
 electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 16.80...18.80  
                           1000S.: (13.80...21.80)

Automatic starting fuel delivery:

2nd speed 1/min: 380

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

3rd speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...56.00  
1000S.: (45.50...60.50)

4th speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...67.00  
1000S.: (37.00...67.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation:  
K mm: 3.2...3.4  
KF mm: KOT  
MS mm: 1.1...1.5  
LDA stroke mm: 5.9  
Ya mm: 28.8...32.8  
Yb mm: 67.0...81.0

Remarks:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2300R433-2  
Type number : 0 460 494 346  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1,9 L UD A3

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 750  
Setting value mm: 4.30...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 750  
Setting value bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 50.00...51.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 37.20...43.20

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 16.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 7.00...8.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2600  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 9.00...13.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...43.00  
mind 1000S.: 37.0  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: -8.0...-12.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: -0.5...-0.7 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 750  
TD travel mm: 8.00...8.60  
mm: (7.50...9.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 750  
TD travel mm: 4.30...4.50  
mm: (3.60...5.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 750  
TD travel mm: 1.50...2.10  
mm: (1.00...2.60)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 4.30...4.90  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 5.40...6.00  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2100  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 7.40...8.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.30)  
2nd speed 1/min: 2100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm3/10s: (40.60...167.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2600  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 9.00...13.00  
1000S.: (7.00...15.00)

8th speed 1/min: 2400  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 32.50...42.50  
1000S.: (31.50...43.50)

9th speed 1/min: 2100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.00...44.00  
1000S.: (40.80...45.20)

12th speed 1/min: 1250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...51.00  
1000S.: (48.30...52.70)

20th speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 43.50...46.50  
1000S.: (42.80...47.20)

21th speed 1/min: 450  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.20...43.20  
1000S.: (34.70...45.70)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.00...18.00  
1000S.: (13.00...21.00)

High Idle:

1st speed 1/mi: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.00...18.00  
1000S.: (13.00...21.00)

Residual:

1.Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...8.00  
1000S.: (5.50...9.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: -7.0...-9.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 0.0...+3.0 z'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250

TD-travel : -0.8...1.2 '  
difference mm: (-0.4...-1.6) '  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply pump-  
pressure : -0.3...-0.7 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.00...36.00  
1000S.: (32.00...38.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...55.00  
1000S.: (35.00...55.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...51.00  
1000S.: (31.00...51.00)

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (32.50...47.50)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS	mm: 1.1...1.5
LDA stroke	mm: -
XK	mm: LP=0.8..3.0
Ya	mm: 37.6...41.6
Yb	mm: 50.4...63.3

Remarks:

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

Z = Absolute delivery

Pump in stepped LDA

Permissible port/port scatter with stop test, electrical = max. 5.0 ccm/1000 S.